PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES

Vol. 47, No. 8, pp. 235-274, 12 figs. October 3, 1991

# A REVISION OF *APHELANDRA* (ACANTHACEAE) IN MEXICO

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ABSTRACT: Twelve species of *Aphelandra* are treated as occurring in Mexico: *A. aurantiaca, A. gigantiflora, A. guerrerensis, A. heydeana, A. hintonii, A. linearilobа, A. madrensis, A. scabra, A. schiedeana, A. speciosa, A. verticillata,* and *A. wendtii.* Six of these, *A. guerrerensis, A. hintonii, A. linearilobа, A. madrensis, A. verticillata,* and *A. wendtii,* are endemic to the country. *Aphelandra wendtii* is newly described from rain forests in Veracruz, Tabasco, and Chiapas. A neotype is selected for *Hemisandra aurantiaca,* and lectotypes are designated for *A. acutifolia, A. aurantiaca* var. *roezlii, A. gigantiflora, A. haenkeana, A. madrensis,* and *A. schiedeana.* Pollen of all 12 species is tricolpate. Chromosome numbers of six species of Mexican *Aphelandra* are all $n = 14$. Keys to the genera of Mexican Aphelandreae and the species of Mexican *Aphelandra* are provided.

Received January 2, 1991. Accepted April 3, 1991.

## INTRODUCTION

*Aphelandra* R. Brown is a genus of about 175 species of perennial herbs, shrubs, and small trees restricted in distribution to the neotropics. The genus is well known to horticulturists in temperate regions because some of the species are cultivated for the ornamental value of the brightly colored inflorescences (e.g., *A. chamissoniana* Nees) or the variegated or colored leaves (e.g., *A. squarrosa* Nees, the zebra plant). Recent systematic studies of the genus include a comprehensive taxonomic revision by Wasshausen (1975) and a monograph of the Central American species of the *A. pulcherrima* complex by McDade (1984). Most of the species are confined to South America (especially southeastern Brazil and the Andes of Bolivia, Peru, Ecuador, and Colombia); however, 31 are known to occur in Central America and Mexico.

In the only comprehensive account of Acanthaceae, Nees (1847) noted the occurrence of seven species of *Aphelandra* in Mexico: *A. acutifolia* Tafalla ex Nees, *A. aurantiaca* (Scheidw.) Lindl., *A. deppeana* Schlecht. & Cham., *A. haenkeana* Nees, *A. pectinata* Willd. ex Nees, *A. pulcherrima* (Jacq.) Kunth, and *A. schiedeana* Schlecht. & Cham. The Mexican report of *A. pulcherrima* was based on a collection made by Haenke from Acapulco now assigned to another species (*A. scabra*), and the report of *A. pectinata* was based on specimens from Colombia and Costa Rica that were erroneously attributed to Mexico. In the related genus *Lagochilium* Nees, considered by Bentham (1876) and subsequent authors to be congeneric with *Aphelandra,* Nees (1847) treated another Mexican collection of Haenke as *L. spicatum* Nees. The holotype of *L. spicatum* at PR is not an *Aphelandra*; rather, it appears to be a species of *Justicia* and was so annotated by Wasshausen in 1971. Hemsley (1882) treated nine species of *Aphelandra* in Mexico, the seven noted

by Nees (1847) under *Aphelandra* and two treated by Nees under other genera (*A. hydromestus* (Nees) Hemsley and *A. verticillata* Nees ex Hemsley). Standley (1926) synonymized *A. hydromestus* and *A. acutifolia* with *A. aurantiaca,* synonymized *A. pectinata* and *A. haenkeana* with *A. deppeana,* and recognized *A. madrensis* Lindau and *A. speciosa* T. Brandegee for a total of seven Mexican species. Wasshausen (1975) recorded 10 species of the genus as occurring in Mexico. He excluded Mexico from the range of *A. pulcherrima* and added *A. guerrerensis* Wasshausen, *A. heydeana* J. D. Smith, *A. hintonii* Wasshausen, and *A. linearilobа* Leonard. He also placed *A. hydromestus* into the synonymy of the Brazilian species, *A. prismatica* (Vellozo) Hiern, and he discounted a Mexican origin for the cultivated material on which the former species was based.

This study presents a taxonomic revision of all species of *Aphelandra* known to occur in Mexico. Data were obtained from more than 1,200 herbarium specimens from 38 herbaria and from living plants observed in the field and greenhouse. Twelve species, consisting of the 10 treated by Wasshausen (1975), one newly described, and one range extension into the country, are recognized as occurring in Mexico in my study. Among the 12 species, six are endemic to Mexico (*A. guerrerensis, A. hintonii, A. linearilobа, A. madrensis, A. verticillata,* and *A. wendtii*), four are restricted to southern Mexico and northern Central America (*A. gigantiflora, A. heydeana, A. schiedeana,* and *A. speciosa*), and two are wide-ranging taxa that attain the northernmost extent of their respective ranges in Mexico (*A. aurantiaca* and *A. scabra*). Information on the 10 species endemic to Mexico and northern Central America was gathered throughout their respective ranges. Studies of *A. aurantiaca* and *A. scabra* were limited to Mexican representatives of these species. Whereas only representative specimens are cited for commonly collected species, all specimens utilized in this study are listed in Appendix B.

In spite of this and other recent work on the genus, knowledge of Mexican *Aphelandra* remains incomplete. For example, *Aphelandra hintonii* is known from only a single collection; fruits are unknown for *A. heydeana* and *A. hintonii*; and unusual plants from the poorly collected Sierra Madre Sur in southern Mexico remain difficult to treat. It is likely that additional species will be discovered in the remote regions of southern Mexico.

Subfamilial Classification.—Both Lindau (1895a) and Bremekamp (1965) included *Aphelandra* in the subfamily Acanthoideae, tribe Aphelandreae. This tribe is characterized by having tricolpate pollen, four monothecous stamens, and a corolla with a distinct upper lip. Genera of Aphelandreae in Mexico can be distinguished by the following key.

1. Corolla 6.5–24 mm long; stamens 1.2–11 mm long, filaments inserted in distal ⅔ of corolla tube (0.36–0.77 the distance up tube from base), usually included in corolla tube; $x = 13$.
   2. Corolla zygomorphic, lobes of upper lip dissimilar to those of lower lip; lobes of upper lip not obovate and usually not more than ½ the length of the lip; plants caulescent; corolla yellow, pinkish, or white; anthers at least partially exserted from corolla tube; stigma bilobed or funnelform. ..... *Holographis.*
   2. Corolla subactinomorphic, lobes more or less similar in form (or upper lip reduced in size relative to lower lip in *S. cordatum, S. chamaeranthemoideum,* and *S. nanum*), upper lip divided nearly to its base into 2 prominent, obovate lobes greater than 2.5 mm long; plants acaulescent (leaves clustered at or near ground) or caulescent; corolla pinkish or purplish (sometimes white); anthers included in corolla tube; stigma funnelform. ..... *Stenandrium.*
1. Corolla 30–80 mm long; stamens 23–60 mm long, filaments inserted in proximal ⅓ of corolla tube (0.14–0.33 the distance up tube from base; or up to 0.40 in *A. verticillata*), always exserted from corolla tube; $x = 14$. ..... *Aphelandra.*

More than 50 species of the New World genus *Stenandrium* Nees have been described, largely from Brazil, the West Indies, and Mexico (Daniel 1985). *Holographis* Nees comprises 15 species confined to Mexico (Daniel 1983, 1988). Relationships among these three genera of Aphelandreae have been discussed by Daniel (1983, 1985) and are further considered with respect to chromosome numbers by Daniel et al. (1984, 1990).

A species of the primarily Brazilian genus

*Geissomeria* Lindl. of the Aphelandreae was described from an unidentified locality in Mexico by Lindau (1895b). Unfortunately, the type of *G. mexicana* Lindau was destroyed at B. No photographs of the holotype, isotypes, or recent collections of the species have been located.

Subgeneric Classification.—There is no recent subgeneric classification of *Aphelandra*. Nees (1847) recognized two sections now regarded as artificial: *Stenochila* with the lateral lobes of the lower lip of the corolla less than one-third as long as the lower-central lobe and *Platychila* with the lateral lobes one-third or more as long as the central lobe. In the former section he included *A. scabra* (as *A. pulcherrima, A. pectinata, A. haenkeana,* and *A. deppeana*) and *A. schiedeana*. *Aphelandra aurantiaca* (including *A. acutifolia*) was included in section *Platychila*. Section *Platychila* was further divided by Nees into subsections "*Genuinae*" with entire leaves and "*Acanthoideae*" with dentate or pinnatifid leaves. Although Lindau (1895a) followed this subgeneric classification, it was ultimately rejected, without being replaced, by Wasshausen (1975). The only group of related taxa recognized since Wasshausen's (1975) monograph is the informal *A. pulcherrima* complex of about 40 species (McDade 1984).

Mexican species of *Aphelandra* are diverse and appear to segregate into seven recognizable groups or alliances: 1) *A. scabra* (in the *A. pulcherrima* complex) with bracteal nectaries and lateral lobes of the lower lip of the corolla reduced and fused to the upper lip; 2) *A. aurantiaca* with the younger stems flattened and the bracts pectinately dentate; 3) *A. verticillata* with quaternate leaves and pollen with bifurcating colpi; 4) *A. speciosa* with bracts large, leathery, arching, glabrous, and apically apiculate; 5) *A. heydeana* and *A. wendtii* with conspicuously reflexed bracts; 6) *A. lineariloba* and *A. madrensis* with relatively short corollas, unequally bilobed stigmas, and filaments with conspicuously flattened trichomes; and 7) *A. gigantiflora, A. guerrerensis,* and *A. schiedeana* with large reddish corollas, erect bracts, and filaments lacking flattened trichomes. *Aphelandra hintonii,* with large corollas and conspicuously flattened staminal trichomes, combines characteristics of the latter two alliances. Additional studies of the genus will be needed in order to place the Mexican species into a subgeneric framework.

Distribution in Mexico.—Of the 12 species of *Aphelandra* in Mexico, seven occur in the southernmost state, Chiapas. Five species are now known from each of the southern states Oaxaca and Guerrero. The numbers of species per state decreases to the north. The majority of species occurs in moist to wet habitats; however, at least *A. scabra* and *A. verticillata* can occur in relatively dry habitats as well.

Several indirect lines of evidence support a hypothesis that *Aphelandra* radiated to Mexico from South America: 1) the greatest concentration and diversity of species is encountered in South America; 2) in most instances, there are clear relationships between the Mexican species or species-groups and South American species; 3) the greatest abundance of Mexican species is in the southernmost regions of the country; 4) both *A. scabra* and *A. aurantiaca,* which attain the northern limit of their distributions in Mexico, exhibit greater morphological diversity in South America; and 5) the monophyletic *A. pulcherrima* complex is most diverse and abundant in South America with only one highly derived species, *A. scabra,* in Mexico (McDade 1984). The presence of six species endemic to Mexico suggests the possibility of some secondary radiation of the genus in that country. If Guatemala, Belize, and El Salvador are considered together with Mexico, 10 of the 12 species of *Aphelandra* occurring in the region are endemic there.

Reproductive Biology.—Mexican species of *Aphelandra* are conspicuous by their large, densely bracteate, and brightly colored inflorescences. The large, tubular, and nectariferous flowers appear to be adapted for pollination by hummingbirds. McDade (1984) reported that hummingbirds pollinated flowers of 10 species in southern Central America, including *A. scabra* (as *A. deppeana*), the range of which extends into Mexico. Hummingbird visitors to *A. scabra* in Mexico were noted on one herbarium level (*Calzada 1626-B*). Nectar quantity of 10 flowers of *A. guerrerensis* grown in a greenhouse, determined according to the method of Baker (1979), was in each instance considerably greater than 8.7 μl (mean ± standard deviation of spot diameter: 22.3 mm ± 3.32). Analysis of nectar sugar composition of *A. aurantiaca, A. gigantiflora, A. guerrerensis, A. lineariloba, A. scabra,* and *A. wendtii* by Dr. C. E. Freeman reveals all to have considerably greater percentages of sucrose than fructose or glucose and usually about twice as much fructose as glucose (Daniel and

Freeman, in prep.). High percentages of sucrose and a hexose imbalance are typically found in flowers known or suspected to be hummingbird-pollinated (Baker and Baker 1983; Freeman and Worthington 1985).

Individuals of most Mexican species of *Aphelandra* flower during November, December, and January, that is, immediately following the wet season in most of southern Mexico. Fruiting usually occurs simultaneously or somewhat later with individuals of most species bearing fruits from December through March. Relatively few fruiting collections are known for most Mexican species. It is not known whether this is a result of poor reproductive success or failure by fieldworkers to collect the slightly less conspicuous fruiting plants.

Aspects of the reproductive biology of the Central American species of the *A. pulcherrima* complex were summarized by McDade (1984, 1985). She noted that among these species autogamy is prevented by exsertion of the stigma beyond the anthers during anthesis. She also demonstrated that whereas several species (or populations) are fully self-compatible, others are partially self-incompatible. Four collections representing three species of *Aphelandra, A. lineariloba* (*Daniel 2138cv*), *A. guerrerensis* (*Daniel 5376cv*), and *A. scabra* (*Daniel 5328cv* and *Daniel et al. 5476cv* [PANAMA.—Canal Area: along "Vine Road" to Fort Kobbe beach, W of Bridge of the Americas, CAS]), were grown from cuttings in a greenhouse during this study and tested for self-compatibility and autogamy as described by Daniel (1990). Fruiting did not occur in any of the artificially self-pollinated flowers nor in any undisturbed flowers. These results suggest that under greenhouse conditions, these three species of *Aphelandra* are neither self-compatible nor autogamous.

Several additional aspects of the floral biology of Mexican species cultivated at the San Francisco Conservatory of Flowers were noted. In *A. scabra* (*Daniel 5328cv*), about 24 hours prior to anthesis, the distal four–five mm of the central lobe of the lower lip curved away from the upper lip with the apex of the lobe recoiling. At anthesis, the entire lower-central lobe separated from the upper lip and over four–five hours progressively reflexed until the distal portion contacted the corolla tube. During the subsequent 24–48 hours, the lower-central lobe continued to recoil from the apex overlapping itself several times. Corollas persisted on the plants for four–six days following the onset of anthesis. In *A. lineariloba* (*Daniel 2138cv*) anthesis began with the lower lip spreading away from and becoming more or less perpendicular to the upper lip. Within 24 hours, the three lobes of the lower lip were reflexed and thereafter withered. The lower lip of *A. guerrerensis* (*Daniel 5376cv*) remained in a position more or less perpendicular to the upper lip from the onset of anthesis until the corolla fell from the plant, a period of from four–eight days for undisturbed corollas and from two–three days for artificially self-pollinated corollas.

PALYNOLOGY.—Previous palynological studies of *Aphelandra* in this century (Raj 1961; Wasshausen 1975; McDade 1984) reveal some diversity in grain shape (spherical to perprolate), exine sculpturing (verrucose, reticulate, psilate), and apertures (tricolpate or polyrugate). Most species examined have prolate to perprolate and tricolpate pollen with variegated exine sculpturing. Untreated pollen from herbarium specimens representing all 12 species of *Aphelandra* occurring in Mexico was examined with the scanning electron microscope in this study (Figs. 1, 2). Grain size ranges from 35–60 μm in length (polar axis) and from 20–42 μm in width (equatorial axis). Grain shape is prolate (varying from subprolate to perprolate) with a ratio of polar to equatorial axes varying from 1.2–2.4. The grains are tricolpate with colpi extending from the equator nearly to or to both poles. In most species the colpi become narrowed as they approach the poles. In some instances (e.g., some grains of *A. madrensis*), the colpi fuse at the poles. In *A. verticillata* (Fig. 1a), the colpi bifurcate into two short segments as they approach the poles. McDade (1984) noted colpi that bifurcate and subsequently fuse with adjacent colpi near the poles in some collections of *A. golfodulcensis* McDade of southern Central America. Colpi that bifurcate near the poles are known in some, but not all, species of the related genus *Holographis* (Daniel 1983; see discussion above and under *A. verticillata*). In addition to the three equatorially positioned colpi, pollen of *A. gigantiflora, A. heydeana, A. lineariloba, A. madrensis, A. schiedeana,* and *A. speciosa* has a three-armed aperture at each pole. The arms of these apertures extend from the poles toward the equator, alternate with the colpi. Their length can be up to one-quarter of the length (polar axis) of the entire grain. These polar apertures are evident in Wass-

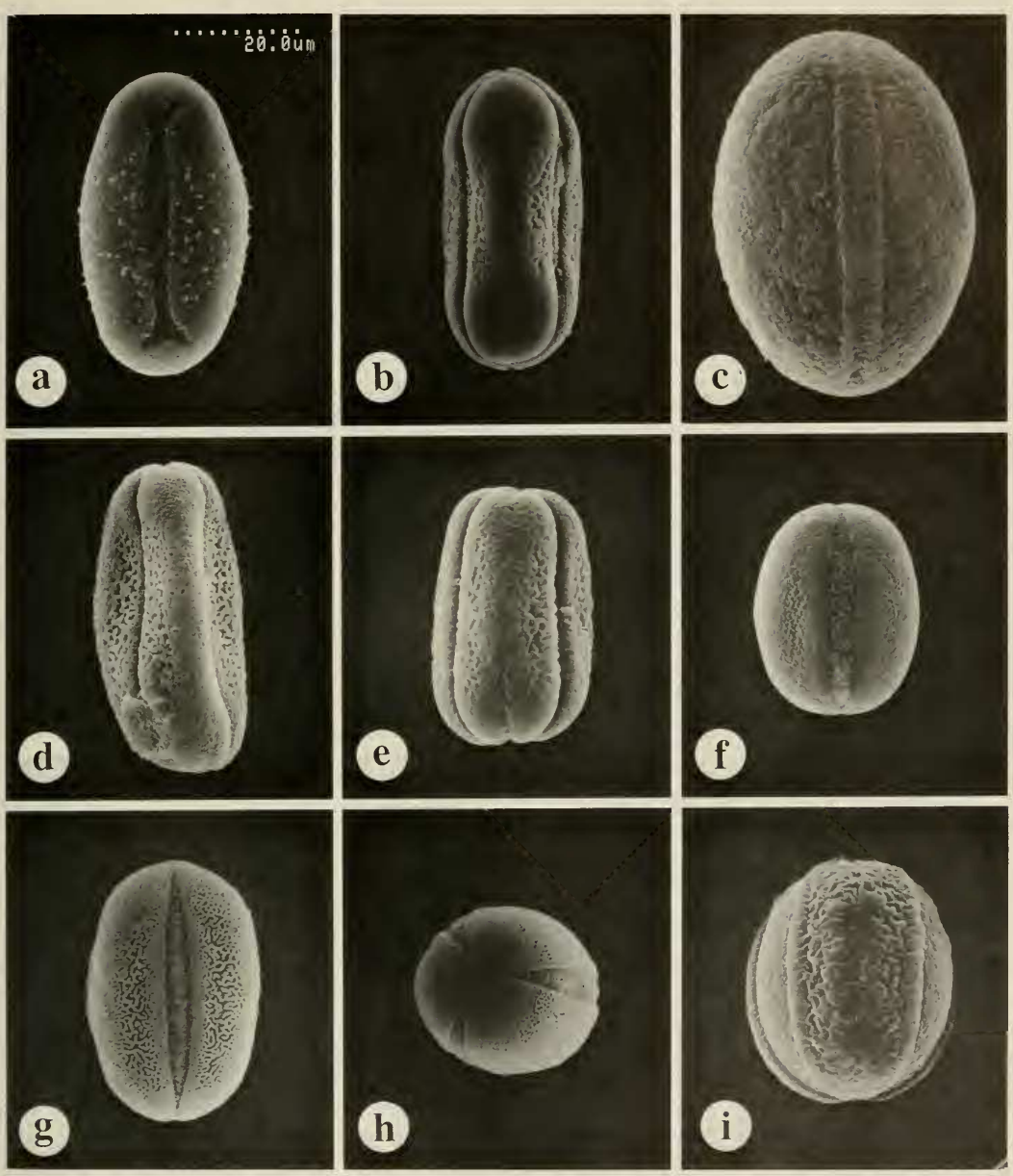



FIGURE 1. Scanning electron micrographs of *Aphelandra* pollen. a, *A. verticillata* (*Daniel et al. 3295*), colpal view; b, *A. scabra* (*Daniel 5328*), intercolpal view; c, *A. aurantiaca* (*Breedlove & Daniel 71287*), colpal view; d, *A. speciosa* (*Croat 40837*), intercolpal view; e, *A. lineariloba* (*Daniel 2138cv*), intercolpal view; f, *A. madrensis* (*Langlassé 806*), colpal view; g, *A. wendtii* (*Breedlove & Smith 22121*), colpal view; h, *A. wendtii* (*Breedlove 22121*), polar view; i, *A. hintonii* (*Hinton et al. 16049*) intercolpal view. Scale in b–i same as in a.

hausen's (1975) micrographs of pollen of *A. lineariloba, A. madrensis,* and *A. schiedeana,* and *A. verticillata* from Mexico and in *A. flava* Nees from South America. Wasshausen's (1975) micrograph of *A. verticillata* (based on *Moore 5503*) is likely mislabeled. Pollen of *A. verticillata* from four specimens (*Daniel et al. 3295, Hinton 13486, Moore 5503,* and *Rzedowski 27991*) examined in my study was homogenous, lacked polar apertures, and had bifurcating colpi. Exine sculp-

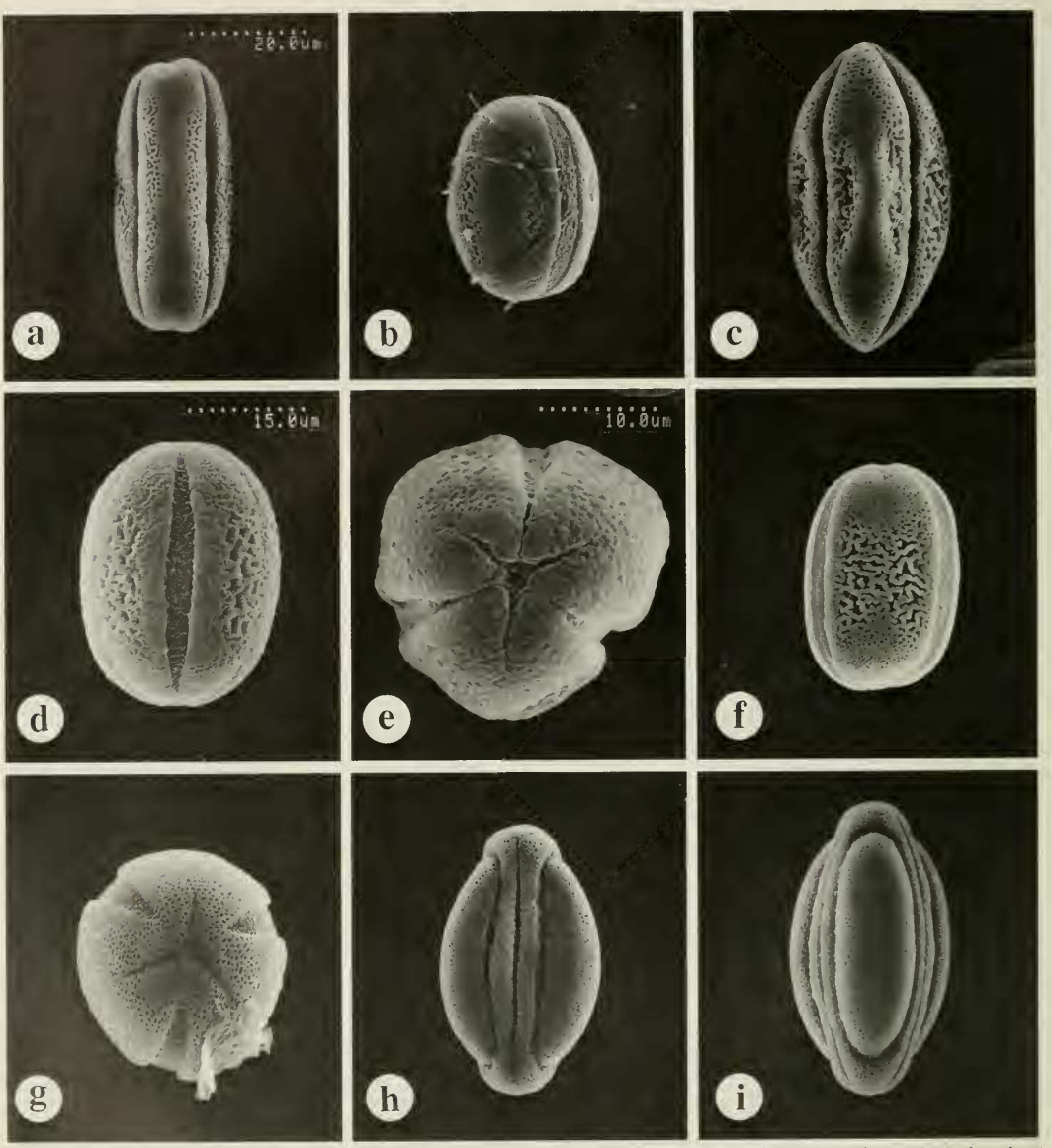



FIGURE 2. Scanning electron micrographs of *Aphelandra* pollen. a, *A. heydeana* (*Breedlove 65803*) intercolpal view; b, *A. guerrerensis* (*Hinton et al. 11199*) intercolpal view; c, *A. guerrerensis* (*Daniel 5376*), intercolpal view; d, *A. gigantiflora* (*Breedlove & Daniel 70900*), colpal view; e, *A. gigantiflora* (*Standley 19771*), polar view; f, *A. schiedeana* (*Ventura A. 12241*), intercolpal view; g, *A. schiedeana* (*Ventura A. 12241*), polar view; h, *A. sp.* (*Delgado S. 655*), colpal view; i, *A. sp.* (*Delgado S. 655*), intercolpal view. Scale in b, c, and f–i same as in a.

turing of Mexican *Aphelandra* generally agrees with that shown by Wasshausen (1975) and McDade (1984). Sculpturing over the colpi varies from psilate in *A. verticillata* to gemmate or verrucate in all other species; that of the mesocolpia varies from foveolate to fossulate (e.g., *A. verticillata*) to more or less evenly reticulate (e.g., *A. madrensis*) to unevenly reticulate with conspicuous, more coarsely rugulate bands or regions flanking the colpi (most species).

Pollen of a single Mexican collection that otherwise greatly resembles *A. gigantiflora* is unique among species of the genus studied to date. It has a pseudocolpal (or colpoid) ellipse in each

mesocolpium (Fig. 2h, i and see discussion under *A. gigantiflora*.)

Chromosome Numbers.—Chromosome numbers have been determined for six species of Mexican *Aphelandra*: *A. aurantiaca, A. gigantiflora, A. guerrerensis, A. lineariloba, A. madrensis,* and *A. scabra.* Like most previous counts for species occurring outside of Mexico, all counts for the Mexican species have been $n = 14$ (Daniel et al. 1990, Daniel and Chuang, in prep.). This number appears to be the base number for *Aphelandra* and clearly delimits the genus from its Mexican relatives in the Aphelandreae, *Holographis* and *Stenandrium,* which appear to have a base number of $x = 13$ (Daniel et al. 1984, 1990).

## Taxonomic Treatment

**Aphelandra** R. Brown, Prodr. Fl. Nov. Holl. 1:475. 1810. Type.—*A. cristata* (Jacq.) R. Brown in Aiton (1812) (*Justicia cristata* Jacq.).

*Hemisandra* Scheidw. Bull. Acad. Roy. Sci. Bruxelles 9:22. 1842. Type.—*H. aurantiaca* Scheidw. (1842) (= *A. aurantiaca* (Scheidw.) Lindl.).

Erect perennial herbs, shrubs, or small trees; cystoliths absent; stems terete to quadrate or sometimes somewhat flattened. Leaves opposite (rarely alternate, ternate, or quaternate), subsessile to petiolate, blades often decurrent along petiole (petiolar wings excluded from leaf blade data in following descriptions), entire, sinuate, lobed, or dentate, flat to undulate. Inflorescence of terminal, simple or branched, usually densely flowered spikes; flowers relatively large, sessile, subtended by paired isomorphic bractlets and a bract; bracts usually subfoliose, green to brightly colored, entire or dentate, often with nectaries on abaxial surface. Calyx divided nearly to or to base into 5 subequal to unequal lobes; corolla variously colored (mostly shades of red, orange, and yellow in ours), tube straight to curved, usually ampliate apically, sometimes bearded within, limb bilabiate, the upper (posterior) lip innermost in bud, often conduplicate and enclosing stamens during anthesis, apically entire to bilobed, margin often flaring outward at base or sometimes for entire length of vertical sides, the lower (anterior) lip spreading to ± perpendicular to upper lip to reflexed to recoiled, conspicuously trilobed or with lateral lobes much reduced to vestigial; stamens 4, usually inserted in basal third of corolla tube (at a point 0.14–0.33[–0.40] the distance up tube from base in ours), didynamous with pairs inserted at slightly different positions in tube (posterior pair inserted up to 1 mm distal to anterior pair in ours), filaments and anthers usually exserted from tube, anthers monothecous, connivent (often in pairs), pairs presented at ± same height or with one pair extending beyond the other, lacking basal appendages, often pubescent, pollen generally subprolate to perprolate, tricolpate, staminode usually present, consisting of a slender short filament, a small triangular projection, or a small callous region, inserted between posterior pair of stamens (i.e., dorsal-most in corolla tube, alternate with 2 fused lobes of upper lip of corolla), glabrous or pubescent; stigma symmetrically to asymmetrically funnelform or shallowly to deeply bilobed, lobes unequal. Capsule ovoid to ellipsoid to subglobose; seeds 4, flattened to subglobose, subelliptic to subcircular to somewhat squarish to subtriangular in outline.

Distribution.—*Aphelandra* extends from the state of Sinaloa in northwestern Mexico (ca. latitude 25° N) southeastward through regions of both wet and dry forests to the state of Santa Catarina in southeastern Brazil (ca. latitude 28° S). The greatest concentrations of species are in the Andes of Colombia, Ecuador, Peru, and Bolivia.

## Key to the Species of *Aphelandra* in Mexico

1. Leaves whorled (4 per node); corolla yellow, 25–35 mm long; pollen with colpi bifurcating toward each pole. ..... 1. *A. verticillata.*
1. Leaves opposite (rarely subopposite); corolla red, orange, or (rarely) yellowish, 30–85 mm long; pollen with colpi tapering toward each pole.
   2. Bracts with 2 submarginal clusters of padlike nectaries (up to 16 per cluster) on abaxial

surface; lower-central lobe of corolla becoming recoiled, the lateral lobes reduced to vestigial toothlike appendages up to 2.5 mm long and attached to upper lip. ..... 2. *A. scabra.*

2. Bracts without padlike nectaries on abaxial surface; lower-central lobe of corolla spreading to reflexed, the lateral lobes conspicuous (3.5–25 mm long) and attached to lower lip.
   3. Young stems somewhat flattened; bracts dentate with 7–15 teeth per side; corolla orange to yellowish. ..... 3. *A. aurantiaca.*
   3. Young stems subterete to quadrate; bracts entire or dentate with 1–2 teeth (sometimes inconspicuous) per side; corolla red or reddish (one collection of *A. heydeana* reported as orange-red with yellowish veins on lower lip).
      4. Inflorescence rachis glabrous; bracts arching away from rachis at maturity, abaxially glabrous, abruptly apiculate (to cirrhous) at apex, the apiculum usually reflexed-coiled; corolla externally glabrous. ..... 4. *A. speciosa.*
      4. Inflorescence rachis pubescent; bracts erect to spreading but not arched, abaxially pubescent (rarely nearly glabrate in *A. wendtii*), rounded to acute to accumulate to aristate at apex, the apical portion sometimes spreading to reflexed but lacking a reflexed-coiled apiculum; corolla externally pubescent.
         5. Corolla 30–42 mm long, the upper lip 6–13 mm long, the lower lip 3.5–13 mm long; stigma unequally bilobed, 0.5–2 mm long; corolla discolorous with limb darker than tube; filaments with conspicuously flattened trichomes.
            6. Lower lip of corolla reflexed, with lobes linear, the lateral 0.6–1 mm wide, the lower-central 0.8–2 mm wide; anterior pair of thecae dorsally glabrous. ..... 5. *A. lineariloba.*
            6. Lower lip of corolla ± perpendicular to upper lip, with lobes narrowly to broadly elliptic to subcircular to obovate, the lateral 1.8–6 mm wide, the central 4–9.5 mm wide; anterior pair of thecae dorsally pubescent with flattened trichomes. ..... 6. *A. madrensis.*
         5. Corolla 41–85 mm long, the upper lip 16–36 mm long, the lower lip 17–39 mm long; stigma funnelform, 0.2–0.5 mm long; corolla concolorous; filaments glabrous or with filamentous trichomes (or if flattened trichomes present, as in *A. hintonii,* then with corolla 60–80 mm long).
            7. Inflorescence appearing subcapitate (rarely elongate); bracts lanceolate to strap-shaped, 5–11 times longer than wide, gradually attenuate at apex; thecae 6.5–8.1 mm long (bracts 28–65 mm long, see below). ..... 7. *A. wendtii.*
            7. Inflorescence elongate; bracts lanceolate to ovate to elliptic to obovate, 1.1–4.9 times longer than wide, rounded to acute to acuminate to caudate at apex; thecae 3–5.5 mm long (or if up to 7 mm long, as rarely in *A. heydeana,* then with bracts 14–26 mm long).
               8. Two filaments distally pubescent with conspicuously flattened trichomes; bractlets 2.5–4 mm wide; lateral lobes of lower lip of corolla obovate–elliptic, 4.5–8 mm wide; inflorescence rachis densely sericeous with silky, flexuose to antrorsely appressed glandular and eglandular trichomes up to 1.5 mm long. ..... 8. *A. hintonii.*
               8. Filaments lacking conspicuously flattened trichomes; bractlets 0.8–2 (–2.5) mm wide; lateral lobes of lower lip of corolla lanceolate to linear-elliptic to oblanceolate, 0.5–5.5 mm wide; inflorescence rachis variously pubescent with glandular and/or eglandular trichomes but not as described above.
                  9. Bracts attenuate-caudate to caudate at apex, the distal portion spreading to reflexed; thecae 5–7 mm long, all apically pubescent (inflorescence rachis eglandular, see below). ..... 9. *A. heydeana.*
                  9. Bracts rounded to acute to acuminate to subfalcate at apex, the distal portion erect; thecae 3–5.5 mm long, only 2, if any, apically pubescent (or if all apically pubescent, as sometimes in *A. gigantiflora* from outside of Mexico, then with inflorescence rachis glandular).

10. Thecae glabrous; pollen lacking 3-armed polar apertures. ..... 10. *A. guerrerensis.*
10. At least 2 thecae (i.e., posterior pair) apically and/or dorsally pubescent; pollen with 3-armed polar apertures.
    11. Rachis viscid with conspicuous glandular trichomes; seeds covered with apically branched or dendritic trichomelike papillae. ..... 11. *A. gigantiflora.*
    11. Rachis pubescent with eglandular trichomes only; seeds nearly smooth or covered with low, rounded encrustations. ..... 12. *A. schiedeana.*

**1. Aphelandra verticillata** Nees ex Hemsley, Biol. Centr. Amer. Bot. 2:513. 1882. (nom. nov. for *Crossandra haenkeana* Nees, based on herbarium name cited by Nees as a synonym of *C. haenkeana*).

*Crossandra haenkeana* Nees in DC. Prodr. 11:281. 1847. (non *Aphelandra haenkeana* Nees, 1847). TYPE.—MEXICO. Western Mexico, 1791, *T. Haenke s.n.* (Holotype: PR!, photo at US!; isotype: PRC!, photo at US!).

Perennial herb or shrub to 3 m tall. Young stems terete to subquadrate, more or less evenly pubescent with flexuose to retrorse eglandular trichomes 0.1–1.2(–2) mm long, becoming glabrate. Leaves whorled, 4 per node, sessile (and sometimes subauriculate) to petiolate, petioles to 45 mm long (naked portion to 2.5 mm long), blades lanceolate to ovate 27–150 mm long, 9–70 mm wide, 2–4.4 times longer than wide, acuminate at apex, rounded to attenuate-decurrent along petiole with a tapering or nontapering wing extending nearly to or to node and sometimes subauriculate to auriculate at base, surfaces pubescent or glabrate, margin entire. Spikes axillary or terminal, elongate, up to 100 mm long (excluding flowers), 13–33 mm wide (excluding flowers) near midspike, rachis puberulent with straight eglandular trichomes 0.05–0.2 mm long. Bracts entirely green or sometimes reddish distally, ovate to elliptic, 11–19 mm long, 3–8.5 mm wide, 1.8–3.7 times longer than wide, acute to acuminate, usually mucronate and erect to somewhat twisted-spreading at apex, abaxial surface pubescent with straight to antrorse, eglandular trichomes 0.05–0.6 mm long, margin conspicuously ciliate with flexuose eglandular trichomes to 2 mm long, entire. Bractlets lanceolate, 10–17 mm long, 1–2 mm wide, aristate at apex, pubescent like bracts. Calyx 12–18 mm long, lobes lanceolate, 1.5–2 mm wide at base, aristate at apex, abaxial surface pubescent like bracts and usually also with inconspicuous glandular trichomes to 0.1 mm long (margin with occasional glandular trichomes to 0.2 mm long). Corolla yellow, 25–35 mm long, externally pubescent with eglandular trichomes 0.05–0.2 mm long, upper lip 8–15 mm long, bilobed with triangular-ovate to linear-elliptic lobes at apex, 3–6.8 mm long, 2.1–2.5 mm wide, margin flared apically if at all, lower lip spreading or ± perpendicular to upper lip, 9–15 mm long, lateral lobes linear to oblanceolate to obovate, 7–13.5 mm long, 1.8–4 mm wide, lower-central lobe elliptic to obovate, 7.5–13 mm long, 4–8 mm wide, 1–1.3 times longer and 1.6–2 times wider than lateral lobes. Stamens 23–28 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments proximally pubescent with filamentous eglandular trichomes, distally glabrous, thecae 2.3–3 mm long, pairs presented at ca. same height, all apically and dorsally pubescent with cobwebby trichomes; staminode 0.5–1.5 mm long, pubescent. Style 24–35 mm long, pubescent (at least proximally) with eglandular trichomes; stigma obliquely funnelform, 0.2–0.5 mm long or unequally bilobed with one lobe 0.1–0.2 mm long and the other 0.2–0.3 mm long. Capsule 10.5–11 mm long, pubescent with mostly straight eglandular trichomes 0.2 mm long. Seeds not seen.

DISTRIBUTION AND HABITAT.—West-central Mexico (Guerrero, México, Michoacán, and Morelos; Fig. 3) in regions of tropical deciduous forest to oak forest at elevations from 500 to 1,550 m.

PHENOLOGY.—Flowering: November–December; fruiting: November.

Using the morphological attributes in the above key to Mexican Aphelandreae, this species should be treated in *Aphelandra*. In many characteris-


FIGURE 3. Distribution of *Aphelandra gigantiflora, A. heydeana, A. hintonii,* and *A. verticillata* in Mexico.

tics, however, *A. verticillata* links *Aphelandra* and *Holographis,* and with some justification, might be treated equally well in the latter genus. Character states of *A. verticillata* suggestive of *Holographis* include quaternate leaves, yellow corollas, and pollen with colpi bifurcating toward the poles. The reddish coloration often present on the bracts and the long stamens are character states more reflective of species of *Aphelandra.* Corolla length and position of insertion of the stamens in the corolla tube represent features of *A. verticillata* that are somewhat intermediate between Mexican species of the two genera. A chromosome number determination for this species is highly desirable and will likely determine its ultimate generic placement. At this time, treating this species in *Aphelandra* rather than *Holographis* is somewhat arbitrary, but follows a conservative taxonomic and nomenclatural course.

ADDITIONAL SPECIMENS EXAMINED.—MEXICO. **Guerrero:** Taxco (Purisima-Pantheon), *R. Abbott 506* (ENCB, GH); Distr. Adama, Temisco, cañón of Río Achotla, *Y. Mexia 8904* (NY); Río de los Sabinos near Los Sabinos, 36–38 km toward Teloloapan from Iguala, *H. Moore 5503* (BM, G, GH, UC, US); near Taxco, *L. Rowntree s.n.* (ARIZ); camino a la torre de microondas Tuxpan, ca. 10 km NE de Iguala, *J. Rzedowski 37165* (ENCB, MEXU). **México:** Distr. Temascaltepec, Ypericones, *G. Hinton 2971* (BM, G, GH, K, MO, NY, TEX, US). **Michoacán:** 14 mi SSW of jct. Hwy. 15 in Zitacuaro toward Huetamo, *T. Daniel et al. 3295* (CAS); Zitacuaro-Enandio, *G. Hinton et al. 13486* (ARIZ, F, GH, K, MICH, MO, NY, TEX, US, W); 3 km S de Paricuaro, sobre la carr. a Tuxantla, *J. Rzedowski 27991* (ENCB). **Morelos:** Cañón de Lobos, KM 120 de la carr. Cuernavaca-Cuautla, *J. Flores C. 246* (ENCB); Sierra Chalchi, S de Tepostlán, *F. Miranda 3807* (MEXU); without locality, *L. Paray s.n.* (MEXU). **State undetermined:** without locality, Expedicion Malaespina, *L. Neé s.n.* (MA).

**2. Aphelandra scabra** (Vahl) Smith in Rees, Cyclop. 39(1): *Aphelandra* n. 3. 1818. *Justicia scabra* Vahl, Enum. 1:120. 1804. TYPE.—Without specific locality, date, or collector (on the reverse side of the specimen are the following notations: "Justicia scabra tetrandra" and "Spec: singulam quod possid. Brugm. dedit"); the protologue notes only, "Habitat in America meridionali" (Holotype: C!, photo at US!).

*Aphelandra deppeana* Schlecht. & Cham. Linnaea 5:96. 1830. TYPE.—MEXICO. **Veracruz:** Hacienda de la Laguna [ca. 15 mi S of Jalapa], September, *C. Schiede 119* (Holotype: B, destroyed, photos at F!, NY!, US!).

*Aphelandra haenkeana* Nees in DC. Prodr. 11:298. 1847. TYPE.—MEXICO. **Veracruz:** Cordillera de Veracruz, Mirador, Tacuapan, près des ruisseaux, June–October 1840, *H. Galeotti 909* (Lectotype: K!; see discussion; isolectotypes BR!, G!, P!, US!, W!).

*Aphelandra pectinata* Willdenow ex Nees in DC. Prodr. 11: 297. 1847. TYPE.—COLOMBIA. **Córdoba:** mouth of the Río Sinú, *H. Cuming 1099* (Lectotype: K!, designated by McDade in 1984).

*Aphelandra fulgens* Decaisne, Rev. Hort. ser. 3, 1:21. 1847. TYPE.—MEXICO. **Veracruz:** Mirador, September 1842, *A. Ghiesbreght 57* (Holotype: P!, photo at US!; isotype P!).

Branched shrub to 3.6 m tall. Young stems subterete to quadrate-sulcate, often with scattered blistery tubercules on the surface, pubescent with (flexuose to) retrorse to retrorse-appressed to antrorse to antrorse-appressed eglandular, often golden or straw-colored trichomes 0.3–1 mm long (at least some antrorse trichomes always present, sometimes restricted to near inflorescence), becoming glabrate. Leaves opposite, subsessile to petiolate, petioles to 85 mm long (naked portion to 35 m long), blades ovate to elliptic to obovate, 50–260 mm long, 19–103 mm wide, 1.4–4.1 times longer than wide, (rounded to) acute to acuminate at apex, gradually to more or less abruptly attenuate-decurrent (often to node) at base, surfaces pubescent with cauline type trichomes (adaxial surface often sparsely so or glabrate), margin entire to sinuate-crenate. Spikes terminal (and often in axils of distal leaves as well), elongate, up to 210 mm long (excluding flowers), 8–25 mm in diameter (excluding flowers) near midspike, rachis pubescent with antrorse eglandular trichomes 0.2–0.9 mm long. Bracts green, often tinged with red or orange, often spreading with age, ovate to elliptic to obovate, 7–18 mm long, 3–7 mm wide, 1.6–2.8 times longer than wide, acuminate, erect or occasionally somewhat spreading at apex, abaxial surface pubescent with antrorse to antrorse-appressed eglandular trichomes 0.05–1 mm long and with 2 clusters of padlike nectaries near margin (one on each side), nectaries (1–)3–10(–16) per cluster, elliptic to circular in outline, 0.2–0.8 mm long, margin ciliate with straight to flexuose eglandular trichomes to 1.2 mm long, coarsely dentate with (1–)3 teeth per side, teeth 0.3–3 mm long. Bractlets lance-subulate to lanceolate, 5–12 mm long, 0.8–1.9 mm wide, attenuate to aristate at apex, abaxial surface pubescent like bracts. Calyx 6–12 mm long, lobes lanceolate, 1.6–3 mm wide at base, acuminate to aristate at apex, abaxial surface sparsely pubescent with trichomes like those of bracts concentrated near distal portion of midvein. Corolla dull red to red-orange, 30–45 mm long, externally pubescent with eglandular trichomes 0.05–2 mm long, upper lip 9–14 mm long, bilobed with lobes triangular, 2–8 mm long at apex, margin not flaring, lower lip 12–17 mm long, lateral lobes appearing attached to upper lip, reduced and often inconspicuous, erect to slightly spreading, triangular to linear 0.2–2.5 mm long, 0.3–1 mm wide, lower-central lobe recurved or coiled, lance-ovate to elliptic, 10–15 mm long, 3–5.5 mm wide, 7.3–24 times longer and 2.8–8 times wider than lateral lobes. Stamens 26–32 mm long, posterior pair inserted 0.5 mm distal to anterior pair, filaments proximally pubescent with filamentous eglandular trichomes, distally glabrous, thecae 3–4.4 mm long (including a short [0.05 mm] basal, spurlike appendage that is sometimes present), anterior pair extended up to 1 mm beyond posterior pair, all 4 apically and dorsally sparsely pubescent with cobwebby or flexuose eglandular trichomes, often becoming glabrate; staminode absent. Style 29–36 mm long, glabrous; stigma asymmetrically funnelform, 0.3–0.7 mm long. Capsule 11–17.5 mm long, glabrous, shiny, often punctate-pitted. Seeds somewhat flattened, subcircular to subtriangular, 3.5–5.3 mm long, 3.3–4.5 mm wide, pubescent with simple to bifurcate to dendritic trichomes 0.05–0.1 mm long (sometimes becoming very sparse or the surface glabrate).

DISTRIBUTION AND HABITAT.—Mexico (Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Tamaulipas, Veracruz, Yucatán; Fig. 4), Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Surinam, and Brazil; plants occur in vegetation types varying from dry to wet (including thorn scrub, tropical deciduous forest, oak forest, pine-oak forest, montane rain forest, and lowland rain forest) at elevations from 10 to 1,200 m. Plants often are found in disturbed habitats as well.

PHENOLOGY.—Flowering throughout the year; fruiting: January–April.

LOCAL NAMES.—"Cola de gallo" (*Chavelas P. et al. ES-2391,* Ver.); "Flor de coyilillo" (*Sousa 2058,* Ver.); "Hoja de espanto" (*Menéndez et al. 400,* Tab.); "Palo blanco" (*Boege 497,* Gro.); "sucsumucuy" (*Hernández G. 1517,* Oax.); "sucsumuycuy" (*Hernández G. 920,* Oax.); "Vara blanca" (*Boege 374,* Gro.); "Vara de San José" (*Herrera C. 35,* Gro.).

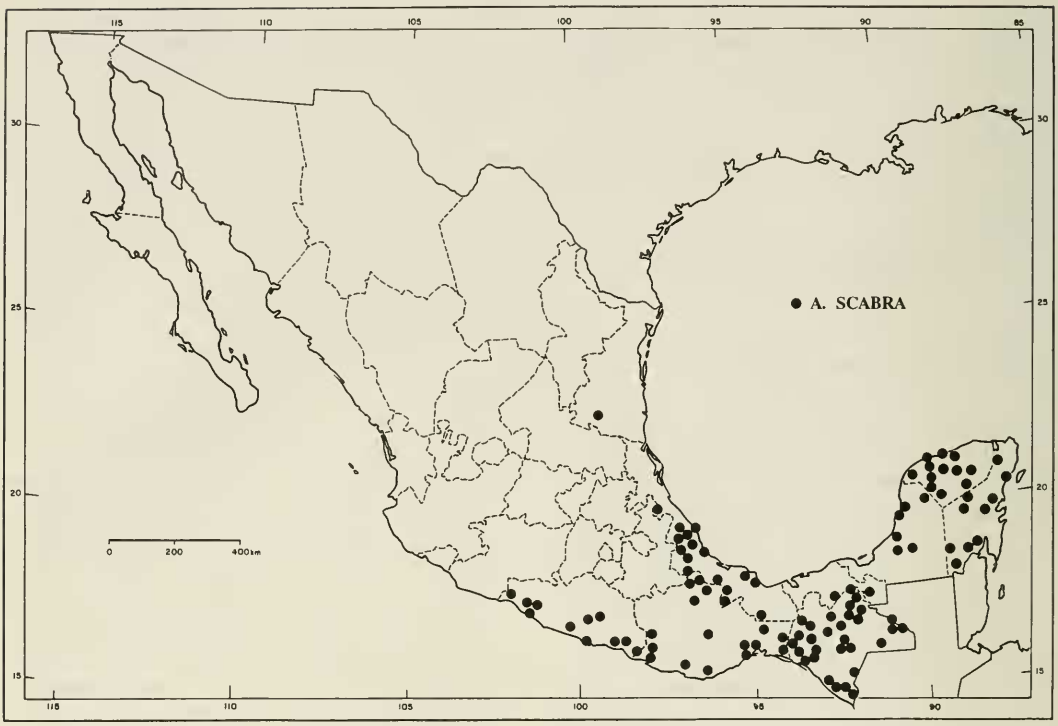



FIGURE 4. Distribution of *Aphelandra scabra* in Mexico.

McDade's (1984) selection of *Galeotti 909* at US as the lectotype of *A. haenkeana* is not in agreement with Article 7.4 of the International Code of Botanical Nomenclature (Greuter et al. 1988) because she designated an isosyntype rather than a syntype. Article 8.1(b) permits another lectotype (i.e., one of the syntypes) to be designated. Thus Galeotti's specimen at K is herewith selected as the lectotype of *A. haenkeana.*

*Aphelandra pectinata* is listed as a Mexican synonym above because two of the syntypes cited by Nees (1847) were attributed to Mexico. In fact both of these were collected elsewhere in Latin America; Humboldt's collection from the Río Sinú is from Colombia and Sinclair's collection from "Nicoza" is undoubtedly from the vicinity of the Gulf of Nicoya in Costa Rica.

*Aphelandra scabra* has the most extensive range of any species in the genus, and its ecological amplitude varies from wet to dry forests. Its ability to colonize disturbed habitats likely has been a contributing factor to both its abundance and wide distribution. McDade (1984) noted considerable variation in leaf size and corolla color (pink, orange, and red) in this species. Plants from Mexico vary in leaf size but have only dull or orangish red corollas. It is probably the most easily distinguishable Mexican species of *Aphelandra* due to the presence of nectaries on the abaxial surface of the bracts. Bracteal nectaries are unknown among other Mexican species of *Aphelandra.* Also, the lower lip of the corolla in *A. scabra* (with the lateral lobes small or vestigial and fused to the upper lip and the central lobe becoming recoiled) is unlike that in the other Mexican species.

The distinctive morphology of the corolla and the bracteal nectaries align *A. scabra* with the *A. pulcherrima* complex as delimited by McDade (1984). Among the 13 Central American species in this alliance, McDade (1984) showed that *A. scabra* (as *A. deppeana*) was most closely related to the Panamanian endemic *A. panamensis* McDade, which differs primarily by its longer corollas.

REPRESENTATIVE SPECIMENS EXAMINED.—MEXICO. **Campeche:** Mpio. Champotón, Yohaltun, 18°53'N, 90°20'W, *C. Chan & E. Ucan 871* (F); Monterrey, *C. Lundell 1227* (F); Mpio. Campeche, 15 km NW de Campeche, camino a Mérida,

*E. Martínez S. 2977* (MEXU); beyond Hoplachen on Campeche-Mérida rd., *H. Moore 8078* (BM, CAS, US); 16 km SE of Champotón, *J. Taylor & C. Taylor 12667* (NY, US); KM 17 de la carr. Escarcega-Champotón, *O. Téllez et al. 6298* (BM, MO); 15 km S de Campeche sobre la carr. de Champotón a Campeche, *O. Téllez et al. 6394* (CAS). **Chiapas**: 1.5–3.5 mi N of Tuxtla Gutiérrez on rd. to Sumidero, *W. Anderson & C. Laskowski 4224* (DUKE, MICH, US); Mpio. Tapachula, Rancho Santa Isabel, 8 km W de Tapachula, *R. Arcos V. 151* (MEXU); Palenque, *A. Armor V30* (F); Mpio. Tenejapa, Shaki 'Uk'um, paraje of Mahben Chauk, *D. Breedlove 7609* (DS, F, MICH, US); 9 km N of Tuxtla Gutiérrez along rd. to El Sumidero, *D. Breedlove 13879* (DS, F, MICH, US); Mpio. Terán, 6.5 km W of Tuxtla Gutiérrez along Hwy. 190, *D. Breedlove 20154* (DS); Mpio. Ocozocoautla de Espinosa, 32 km SW of Ocozocoautla, *D. Breedlove 27476* (CHAPA, DS, DUKE, MICH, MO, NY); Mpio. Arriaga, 13 km N of Arriaga, *D. Breedlove 28299* (DS, DUKE MICH, MO); Mpio. Las Margaritas, W side of Laguna Miramar, E of San Quintín, *D. Breedlove 33349* (DS, DUKE, F); Mpio. Catazaja, 18 km E of Catazaja, *D. Breedlove 47219* (CAS); Mpio. La Libertad, 15–20 km toward Chancala on rd. to Bonampak from Palenque-Ocosingo rd., *D. Breedlove 49152* (CAS); Mpio. Bachajon, 3 km N of Bachajon-Ocosingo rd. at Temo on rd. to Palenque, *D. Breedlove 52486* (CAS); Mpio. Socoltenango, 30 km ESE of Pugiltic on rd. to Comitán, *D. Breedlove 53638* (CAS, DUKE); Mpio. Ocosingo, near El Real, E of Ocosingo, *D. Breedlove 56376* (CAS, LL); 11 km SW of Fronteras Comalapa along rd. to Motozintla, *D. Breedlove 65534* (CAS); Mpio. Berriozábal, Rancho Cruz Ancho at Pozos de Berriozábal, *D. Breedlove 70400* (CAS); Mpio. Huixtla, 6–8 km NE of Huixtla on rd. to Motozintla, *D. Breedlove & A. Smith 22544* (CHAPA, DS, MO); 2 mi S of Tuxtla Gutiérrez along rd. to Villa Flores, *D. Breedlove & P. Raven 13351* (DS, MICH, US); Mpio. Villa Corzo, along Colonia Vicente Guerrero on rd. to Finca Cuxtepec, *D. Breedlove & J. Strother 46596* (CAS); Mpio. Cintalapa, La Mina Microwave Station, 12 km S of Hwy. 190 near Rizo de Oro, *D. Breedlove & R. Thorne 20667* (DS, DUKE, MO); Mpio. Mapastepec, 10 km SE of Mapastepec, *D. Breedlove & R. Thorne 30734* (CHAPA, DS, MICH); carr. Ocosingo-Palenque, 25 km N de la desviación al Parque Natural Cascadas de Agua Azul, *E. Cabrera & H. de Cabrera 6199* (NY); Tuxtla Gutiérrez, El Zapotal, *C. Cowan 5025* (CAS, TEX); along Hwy. 190, 2.4 mi NE of Oaxaca border, *T. Daniel 1282* (CAS, MICH); along Hwy. 190, 56 km SW of Cintalapa toward Tehuantepec, *T. Daniel et al. 5867* (CAS); Mpio. Tonalá, Cerro Bernal, ca. 25 km SE of Tonalá, *G. Davidse et al. 30143* (CAS, DUKE); 7 km al NE de Belisario Domínguez, carr. Huixtla-Motozintla, *A. Delgado S. et al. 799* (DS, MEXU); Sierra de Soconusco, from Escuipulas to Canada Honda, *E. Hernández X. & A. Sharp X-301* (DS); 6 km al SE de Escuintla sobre la carr. al Panteon, *L. Hilerio A. 5* (MICH); Mpio. Venustiano Carranza, Soyatitán, along rd. from Pinola Las Rosas to Pugiltic, *R. Laughlin 2024* (DS, US), *A. Ton 3106* (DS, DUKE, F); Río Lacantun, several mi above mouth, *C. Lundell 17855* (LL, MO); Ocozocoautla, La Roblada, *T. MacDougall H5* (US); Cintalapa, Rizo de Oro, *T. MacDougall s.n.* (F, NY); El Sumidero, Tuxtla Gutiérrez, *T. MacDougall s.n.* (NY); Simojovel, *T. MacDougall s.n.* (NY); Mpio. Ocosingo, 10 km SE de Crucero Corozal, camino a Boca Lacantum, *E. Martínez S. 7430* (MEXU, NY); Escuintla, *E. Matuda 151* (MICH, MO, US); Mt. Ovando, near Escuintla, *E. Matuda 6162* (F, LL, MO, US), *6198* (LL, MO); San Pedro, *C. Mell 561* (NY, US); Mpio. Amatenango del Valle, 17 km N de Amatenango, *O. Téllez & R. Pankhurst 7071* (MEXU); Mpio. Tenejapa, Tih Ha', paraje of Mahbenchauk, *A. Ton 1395* (DS, F, MICH, US); Mpio. Chiapa de Corzo, El Chorreadero, 5.6 mi SE of Chiapa de Corzo, *A. Ton 2950* (DS, DUKE, NY, US), *3256* (DS, DUKE, F, MICH, NY); Mpio. Simojovel de Allende, along rd. from El Bosque to Simojovel, *A. Ton 3076* (DS, DUKE, MICH, NY); Mpio. Venustiano Carranza, above Finca Carmen along rd. from Acala to Pugiltik, *A. Ton 3211* (DS, MICH, NY); Mpio. Tapachula, La Trinidad, *E. Ventura & E. López 816* (BM); Mpio. Frontera Comalapa, ca. 2.25 km (air) S of Col. Vera Paz, *B. Voorhies & A. Sanchez 72–29* (DS). **Guerrero**: vicinity of Acapulco, *G. Barclay 1973* (BM), *W. Boege 497* (MEXU), *G. Lay & A. Collie s.n.* (BM), *L. Neé s.n.* (MA), *E. Palmer 174* (BM, E, F, K, MO, NY, UC, US), *A. Sinclair s.n.* (E), *Voyage de la Venus s.n.* (P); 5–6 mi E of Acapulco on Hwy. 95, *M. Carlson 3066* (DUKE, F, NY, US); along Hwy. 134 between La Salitrera and Coyuca de Catlán, 18.5–18.9 km NE Hwy. 200, *T. Daniel 5328* (CAS), cuttings from this locale grown at San Francisco Conservatory of Flowers, *T. Daniel 5328cv* (CAS); Mpio. Cuajinicuilapa, camino a Huajintepec a 49 km de la desviación a Cuajinicuilapa, *G. Gaxiola 190* (MEXU); Mpio. San Luis Acatlán, 8 km NE de Horcastitas, *J. González L. 276* (MEXU); Mpio. Cuautepec, San Agustín Cuilutla, *N. Herrera C. 35* (MEXU); Vallecitos, *G. Hinton et al. 9903* (ARIZ, K, NY, US, W), *11477* (ARIZ, DS, K, NY, US, W); Atoyac, *G. Hinton et al. 10919* (ARIZ, F, K, MO, NY, UC, US); Carrizo-El Río, *G. Hinton et al. 14691* (ARIZ, DS, NY, US, W); Mpio. La Unión, 8 km N de La Unión, *S. Koch & P. Fryxell 83117* (CAS, CHAPA, TEX); area del Jardín Zihuatanejo, cerro a 1 km del pueblo de Zihuatanejo, *M. Lad. O. et al. 247* (CAS); La Botella, *E. Langlassé 679* (K, US); La Roqueta Island off Acapulco, *I. Langman 3309* (US); beyond Acahuizotla on hwy. to Acapulco, *H. Moore 5108* (BM, UC, US); between Copala and Juchitango, *E. Nelson 2297* (US); Mpio. Chilpancingo, "Poza azul," 11.7 km W del Ocotito camino a Sta. Bárbara, *R. Torres C. et al. 1857* (CAS, CHAPA); Mpio. Quechultenango, 4 km NE de Colotlipa, *M. Zamora M. 5273* (MEXU, NY). **Oaxaca**: Voca del monte inter Tehuantepec et sinum Mexicanum, *G. Andrieux 131* (K, P, W); Distr. Tuxtepec, Temascal lado E de la Presa Miguel Alemán, *R. Cedillo T. & R. Torres 1044* (LL, MEXU); Chiltepec, *R. Cedillo T. et al. 1649* (CAS, MEXU); Distr. Juchitán, Cerro Santo Domingo, *C. Conzatti 3735* (US); along Hwy. 125 between Pinotepa Nacional and Tlaxiaco, *T. Croat 45777* (CAS, MO); along Hwy. 131 between Puerto Escondido and Sola de Vega, 22.4 km N jct. Hwy. 200, *T. Daniel 5374* (CAS); E of Soledad (near Mitla), *W. Ernst 2555* (MEXU, MICH, US); Mpio. Sta. María Chimalapa, ca. 4–5 km N de Sta. María, *H. Hernández G. 342* (CAS, CHAPA); Mpio. Ixtaltepec, 25 km N de Juchitán, *S. Koch et al. 78292* (MEXU, US); Comaltepec, *F. Liebmann s.n.* (K); Tapesco, S of Tres Cruces, Tehuantepec, *T. MacDougall H56* (US); Putla, S. Vicente, *T. MacDougall s.n.* (F, MICH, NY, US); Tehuantepec, Potrero Villalobos, *T. MacDougall s.n.* (F, NY); Distr. Tuxtepec, Chiltepec and vicinity, *G. Martínez C. 254* (MEXU, UC, US), *808* (MICH); Mpio. Salina Cruz, Santa Cruz Hidalgo, el lado E de Cerro Marimba, *C. Martínez R. 263* (CAS); Mpio. Tehuantepec, Rancho El Limon, 17 km O de Tehuantepec, *C. Martínez R. 926* (CAS); Mpio. Matías Romero, Los Angeles, 20 km NO del entronque con la carr. Matías Romero-Acayucan, *C. Martínez R. 1098* (CAS); Mpio. San Miguel Chimalapa, Arroyo El Caracol, ca. 1 km NO de Congregación Benito Juárez, 16°43'N, 94°09'W, *S. Maya J. 525* (CAS); Cafetal Concordia (Cerro Espino), *B. Reko 3626* (US); Temascal, *M. Sousa s.n.* (MEXU);

El Cerro de Cosolapa, Cosolapa, *J. Vera S. 2617* (MEXU, MICH, US); Dto. Jamiltepec, 3 km NE de Flores Mágon, *P. Tenorio L. et al. 2718* (CAS); Dto. Jamiltepec, Dos Caminos, 12 km del entronque brecha a San Agustín Chayuco con la carr. Jamiltepec-Pinotepea Nacional, *P. Tenorio L. 3066* (CAS); Mpio. Ayautla, 4 km NE de Ayautla, *P. Tenorio L. & G. Dieringer 10695* (CAS, MEXU); Mpio. Sta. María Jacatepec, 28 km SO de Tuxtepec, *R. Torres C. & E. Martínez S. 11077* (CAS); 2.5 km N de Sta. Cruz Flores Mágon y 19 km N de Jamiltepec, *R. Torres C. et al. 1678* (MEXU). **Quintana Roo:** 4 km S de Nuevo Xcan, rumbo a Cobá, *E. Cabrera & L. Cortez 269* (BM, MEXU, NY); 4 km N de Estero Franco, en el camino a Tomás Garrido, *E. Cabrera & H. de Cabrera 3301* (MEXU, MO); en la brecha de Divorciados a La Pantera, por la vía corta a Mérida, *E. Cabrera & G. Durán 750* (CAS, MEXU); en la brecha a Chanca, Ver., 9 km S de Carrillo Puerto, *E. Cabrera & R. Torres 1073* (BM, CAS, MEXU); Hwy. 186, 15 mi W of jct. Hwy. 186 with Hwy. 307, *D. Dreyer 343* (CAS, MEXU); Chichankanab, *G. Gaumer 1488* (F, US); Lake Chichankanab, *G. Gaumer et al. 23650* (BM, K, US); 3 km ENE de F. Carrillo Puerto, camino a Vigía Chico, *H. Quero et al. 2816* (MEXU, MO); 36 km S of Dzuiche on Hwy. 164, 19°40′N, 88°35′W, *K. Roe et al. 1349* (US); 3 km SE de Chunhuhub, *O. Téllez & E. Cabrera 1758* (MEXU, MO, NY); Chetumal, Cenote Azul junto a la Laguna de Bacalar, *A. Villamar s.n.* (DS); KM 6 carr. F. Carrillo Puerto-Cancún, *R. Villanueva 845* (MEXU). **Tabasco:** San Pedro, Ejido López Zamora, *J. Calzada & A. Gómez-Pompa 2304* (F); Mpio. San Pedro Balancán, limite E de la zona de Reserva Federal sur del Plan Balancán-Tenosique, *J. García F. & J. Palma G. 84* (CHAPA); Cerro de Tortugero, 7 km S of Macuspana, *C. Gilly & E. Hernández X. 393* (MICH); 3 km del C-30 sobre la brecha W-0 (Norte 33), Balancán, *F. Menéndez et al. 400* (CAS, MEXU, MO); Balancán, carr. 20, 4 km de la carr. 0 (Cerro) en dirección W, *A. Novelo et al. 32* (K, MO); Parque Nacional de Agua Blanca, Macuspana, KM 64 carr. Villahermosa-Escárcega, 17°38′N, 92°30′W, *L. Ruíz P. 8* (CHAPA); Mpio. Balancán, El Arenal, *F. Ventura A. 20921* (CAS). **Tamaulipas:** near Gómez Farias, ca. 0.5 mi N on rd. to Aguacates, *A. Richardson 946* (TEX). **Veracruz:** El Salto de Eyipantla, 8 km de Sihuapan, San Andrés Tuxtla, *J. Calzada 1052* (CAS, F, NY), *1626-B* (BM, CAS, CHAPA); Mpio. Playa Vicente, Ejido Piedra de Cal, *J. Chavelas P. et al. ES-4281* (MEXU); 17 km de Palma Sola, hacia Cardel, *F. Chiang 334* (MEXU); Dos Ríos, Cerro Gordo, *J. Dorantes 367* (F, MO); ladera NE del Cerro Monte de Oro, *J. Dorantes et al. 922* (CAS, F); Laguna Verde, Alto Lucero, *J. Dorantes et al. 5082* (BM, F, MEXU); Region of San Andrés Tuxtla, *R. Dressler & Jones 230* (BM, MICH, MO, NY, UC, US); Mpio. Jesus Carranza, along Río Jaltepec, *C. Gilly 36* (MICH); Laguna near Veracruz, *J. Greenman 71* (F, NY); Río Antigua ca. 38 km WNW of Veracruz toward Xalapa, 19°18′N, 96°28′W, *H. Iltis & A. Lasseigne 843* (F, US); Zacuapan, *F. Liebmann s.n.* (K); Consoquitla pr. Mirador, *F. Liebmann s.n.* (K); Mirador, *J. Linden 189* (G, K); Atoyac, NO de Cordoba, *A. Lot 555* (CAS, F); Mpio. de Cosamaloapan, Aleman, *G. Martínez C. 1150* (BM, CAS, F, MEXU, MICH, MO, NCU, US); Mpio. Coatepec, 5 km (air) SE of Tuzamapan, *M. Nee & K. Taylor 26016* (NY); Zacuapan, *C. Purpus 1938* (BM, E, F, MO, NY, UC, US); Banos del Carrizal, *C. Purpus 6073* (E, UC); Zacuapam, Rancho Viejo, *C. Purpus 10878* (BM, DS, M, MICH, UC, US); Buenaventura, *H. Ross 1077* (M); Salta de Ayipantla, 5 km S of San Andrés Tuxtla, *S. Solheim & V. Powers 868* (WIS); Mpio. Zapata, La Laja, entre Corral Falso-Pinoltepec, carr. Jalapa-Veracruz, *L. Trejo 85* (MEXU); Mpio. San Pedro Soteapan, 2 km Soteapan camino Las Cascadas, 18°14′N, 94°52′W, *F. Vasquez B. & D. Hernández L. 89* (F); Mpio. Hidalgotitlán, Río Soloxuchil entre Hermanos Cedillo y La Escuadra, *M. Vasquez et al. 985* (MEXU, NCU); Mpio. de Dos Ríos, Miradores de Poblado, *F. Ventura A. 2544* (DS, MICH, NY); Puente Nacional, *F. Ventura A. 2637* (CAS, MICH, NY); Mpio. Totutla, Encinal, *F. Ventura A. 7049* (MICH); Mpio. Puente Nacional, La Ceiba, *F. Ventura A. 9235* (MICH); Mpio. Alto Lucero, Blanca Espuma, *F. Ventura A. 9326* (MICH); Mpio. Actopan, Villa Nueva, *F. Ventura A. 12101* (MEXU); Mpio. Emiliano Zapata, "La Laja," 16 km SE de Xalapa, *L. Villarreal 79949* (IBUG). **Yucatán:** Cenote Ainil ca. 6 mi N of Muna, *M. Butterwick 184* (LL); 8 km O de Cacalchen, carr. Texkokob-Tekanto, *E. Cabrera & H. de Cabrera 9474* (MEXU); Sayil, 36 km SO de Oxkutzcab, *E. Cabrera & H. de Cabrera 9562* (MEXU); Coba, *R. Crockett 150* (US); vic. of Sayil, *S. Darwin et al. 2166* (F, MO); Uxmal, near ruins, *O. Degener & I. Degener 26785* (NY, US, W), *A. Schott 671* (BM); Mpio. Oxkutzcab, 4 km W de Sayil, *A. Espejo et al. 1233* (CHAPA); Uayma, ca. 20 km NW von Valladolid, 20°44′N, 88°19′W, *H. Flügel & E. Geiseler 7017* (B); near Izamal, *G. Guamer 300* (ARIZ, BM, CAS, DS, E, F, K, MICH, MO, NY, UC, US, W), *s.n.* (F), *C. Seler & E. Seler 3932* (F); Kancabconot, *G. Guamer et al. 23587* (F, MA, MO, UC, US); Mpio. Valladolid, 2.5 km del Poblado Unión Libre a Yaxcabá, *M. Magaña & S. Zamudio 524* (CHAPA, MEXU); rd. to Tepakaam, *C. Millspaugh 91* (CAS, F, US); Mpio. Chablekal, Dzibichaltun, *M. Ordonez 43* (F); Col. 18 km N of Colonia, *R. Read et al. 79-005* (US); Chichén Itzá, *V. Rudd 2033* (US), *W. Steere 1481* (MICH); Mpio. Santa Elena, 0.5 km SW of entrance rd. to Kabah archaeological site on Hwy. 261, between Hopelchén and Mérida, *A. Sanders et al. 9619* (CAS); Muna, *W. Steere 2151* (F, MICH, MO); Progreso, *W. Steere 3012* (MEXU, MICH, US); Hacienda Chunchucmil, 30 km NW of Maxcanu, ca. 20°41′N, 90°13′W, *L. Ortega T. & E. Mena P. 746* (CAS); Mpio. Dzoncauich, Chacmay, 21°02′N, 88°57′W, *P. Yam P. & L. Yam O. 40* (F). **State undetermined:** without locality, *Grisebach s.n.* (K), *E. Kerber s.n.* (US), *J. Linden s.n.* (MICH), *M. Sessé et al. 280* (MA), *290* (MA), *300,* (F, MA), *s.n.* (BM, OXF).

### 3. **Aphelandra aurantiaca** (Scheidw.) Lindl. Bot. Reg. 31:pl. 12. 1845. *Hemisandra aurantiaca* Scheidw. Bull. Acad. Sci. Bruxelles 9: 22. 1842. TYPE.—Bot. Reg. 31:t. 12. 1845 (Neotype, designated here; see discussion).

*Aphelandra acutifolia* Tafalla ex Nees in DC. Prodr. 11:299. 1847. TYPE.—MEXICO. **Oaxaca:** Sierra S. Pedro Nolasco, Talea, etc., 1843–44, *C. Jürgensen 648* (Lectotype: K ex hb. Hooker!, designated here; isolectotypes: BM!, G!, photo at US!; see discussion).

*Aphelandra aurantiaca* var. *roezlii* Ortgies ex L. Van Houtte, Fl. Serres Jard. 17:53. 1868. (as "roezli"). TYPE.—Fl. Serres Jard. 17:t. 1741–1742. 1868 (Lectotype, designated here; see discussion).

*Aphelandra roezlei* E. Carrière, Rev. Hort. 44:100. 1872. TYPE.—(see discussion).

Mostly unbranched (monocaulous) perennial herb to 1.2 m tall. Young stems somewhat flattened, glabrous or rarely sparsely pubescent with retrorse eglandular trichomes 0.1–0.3 mm long.


FIGURE 5. Distribution of *Aphelandra aurantiaca* in Mexico.

Leaves opposite, petiolate, petioles to 50 mm long (naked portion to 35 mm long), blades ovate to ovate-elliptic to elliptic, 55–260 mm long, 25–115 mm wide, 1.7–3.8(–6.3) times longer than wide, acuminate (to rounded-apiculate) at apex, rounded to abruptly or gradually attenuate-decurrent (sometimes nearly to node) at base, surfaces glabrous or with scattered trichomes along midvein on abaxial surface, margin entire to subcrenate. Spikes terminal (and sometimes in axils of distal leaves as well), elongate, up to 200 mm long (excluding flowers), 15–33(–55) mm in diameter (excluding flowers) near midspike, rachis pubescent with straight to flexuose to antrorse eglandular and glandular (sometimes absent) trichomes 0.1–0.4 mm long. Bracts green or reddish (sometimes green with reddish coloration at margin and apex), sometimes spreading with age, lance-ovate to ovate-elliptic to elliptic, 15–37 mm long, 6–15 mm wide, 2.3–4.2 times longer than wide, acuminate and erect at apex, abaxial surface sometimes impressed punctate, pubescent with antrorse (near base of bract) to straight eglandular trichomes 0.05–0.2 mm long and glandular trichomes 0.05–0.2 mm long (the latter sometimes not evident on older bracts), proximal bracts sometimes also pubescent with antrorse to antrorse-appressed eglandular trichomes to 0.4 mm long, margin ciliate with eglandular trichomes to 0.4 mm long, dentate with 7–15 teeth per side, teeth 0.1–2 mm long. Bractlets subulate to lance-subulate to lanceolate, 7–15 mm long, 0.5–2 mm wide, subaristate to aristate at apex, abaxial surface pubescent like bracts (although with glands often more conspicuous). Calyx (sometimes bilabiate with posterior 2 lobes fused nearly to apex) 10.5–16.5(–19) mm long, lobes lanceolate to lance-subulate, 1.5–3 mm wide at base, attenuate to aristate at apex, abaxial surface pubescent like bractlets. Corolla orange to reddish orange (often with yellow markings on inner surface of lips) or yellow, 50–63 mm long, externally pubescent with eglandular and glandular (often absent) trichomes 0.05–0.2 mm long, upper lip 17–25 mm long, entire to emarginate with rounded lobes up to 0.3 mm long at apex, margin flaring along most or all of the 2 vertical sides, lower lip ± perpen-

dicular to upper lip, 17–25 mm long, lateral lobes obovate to elliptic to ovate-elliptic, 9.5–15 mm long, 5–10.5 mm wide, lower-central lobe ovate-elliptic to elliptic to obovate, 14–25 mm long, 7–16 mm wide, 1.5–1.8 times longer and 1.4–2.2 times wider than lateral lobes. Stamens 39–51 mm long, posterior pair inserted ca. 0.5 mm distal to anterior pair, filaments pubescent with eglandular trichomes throughout their length (more abundant distally than proximally), thecae 4–5 mm long, pairs presented at ca. same height, all apically and dorsally pubescent (sometimes sparsely so) with cobwebby trichomes; staminode reduced to a thickened callous. Style 45–57 mm long, pubescent (especially proximally, becoming less so distally) with eglandular trichomes; stigma unequally bilobed (often appearing obliquely funnelform) with 1 lobe 0.4–1 mm long, the other nearly obsolete or 0.1–0.2 mm long. Capsule 12.5–17 mm long, pubescent with straight to flexuose to retrorse to antrorse eglandular and glandular (at least on distal portion) trichomes 0.05–0.2(–0.5) mm long. Seeds flattened, subcircular to somewhat squarish, 3.3–5.5 mm long, 2.8–4.5 mm wide, covered with coarse, mostly appressed, often apically bifurcate trichomelike papillae 0.05–0.2 mm long.

Distribution and Habitat.—Southern Mexico (Chiapas, Oaxaca, Tabasco, Veracruz; Fig. 5), Guatemala, Belize, Honduras, Costa Rica, Panama, Colombia, Surinam, French Guiana, Ecuador, Peru, Brazil, Bolivia; plants occur in lowland and montane rain forests at elevations from 50 to 1,700 m

Phenology.—Flowering: throughout the year; fruiting: November–March.

In the protologue of *Hemisandra aurantiaca* a type was not designated and neither specimens nor illustrations were cited. Scheidweiler (1842) noted that plants of this species were grown in the Royal Greenhouses at Laeken and at the Jardin Botanique de Bruxelles in 1839 from seeds procured in Mexico. The only specimen originating from cultivation at BR is a sheet from the Martin Martens collection received in 1932 with the notation, "ex horto 1852." It is not known whether this collection was made from plants originally introduced in Belgium in 1839. In the absence of a holotype or any materials from which to choose a lectotype, the first illustration of this species to be published—that accompanying Lindley's new combination—is selected as the neotype. Further information concerning the origin of the plants cultivated in Belgium was provided by Van Houtee (1868). He noted that the plant treated by Lindley as *A. aurantiaca* was discovered in Tabasco, near Teapa, at an altitude of 2,500 feet by Linden. The plant was sent to Belgium and propagated there. Two of Linden's collections of this species from near Teapa are extant in various herbaria (see below).

Syntypes from Mexico, Peru, and Surinam were cited by Nees for *A. acutifolia.* Wasshausen (1975) included all of the syntypes (or isosyntypes) within *A. aurantiaca.* A specimen of the Mexican collection is selected here as the lectotype.

The protologue of *A. aurantiaca* var. *roezlii* indicates that the name is based on cultivated plants obtained by Benedict Roezl in Mexico (Van Houtte 1868). McVaugh (1972) noted that Roezl rarely, if ever, preserved herbarium specimens of his American collections for European gardens. In any event, the location of Van Houtte's herbarium and types is unknown (Stafleu and Cowan 1986). The colored plate (1741–1742) opposite page 53 in the protologue is herewith designated as the lectotype of *A. aurantiaca* var. *roezlii* because it is the only known element from the original material eligible to serve as the nomenclatural type (Greuter et al. 1988, Art. 7).

Wasshausen (1975) treated the name *A. roezlei* as a combination based on *A. aurantiaca* var. *roezlii.* Undoubtedly the name is derived from Van Houtte's variety; however, because he neither indicated the name as a new combination nor listed the basionym, Carrière's name must be treated as designating a new species rather than comprising a new combination. The protologue of *A. roezlei* appears to be based largely on cultivated plants. No specimens or illustrations were cited. A neotype would have to be selected in order to typify this name.

Both *A. aurantiaca* var. *roezlii* and *A. roezlei* were distinguished primarily by the light-colored regions of the leaves. Although some collectors of *A. aurantiaca* from adjacent countries (e.g., Belize: *Schipp 1063,* MICH) have noted a light-colored mottling on the leaves of some plants, such was not noted on labels of Mexican collections examined in this study. Some conspicuous whitish or grayish coloration along the major veins is evident among dried specimens of several Mexican collections (e.g., *Martínez C. 397,* MICH), however. This type of variation in leaf coloring is particularly evident in some South American representatives of *A. aurantiaca* (e.g.,

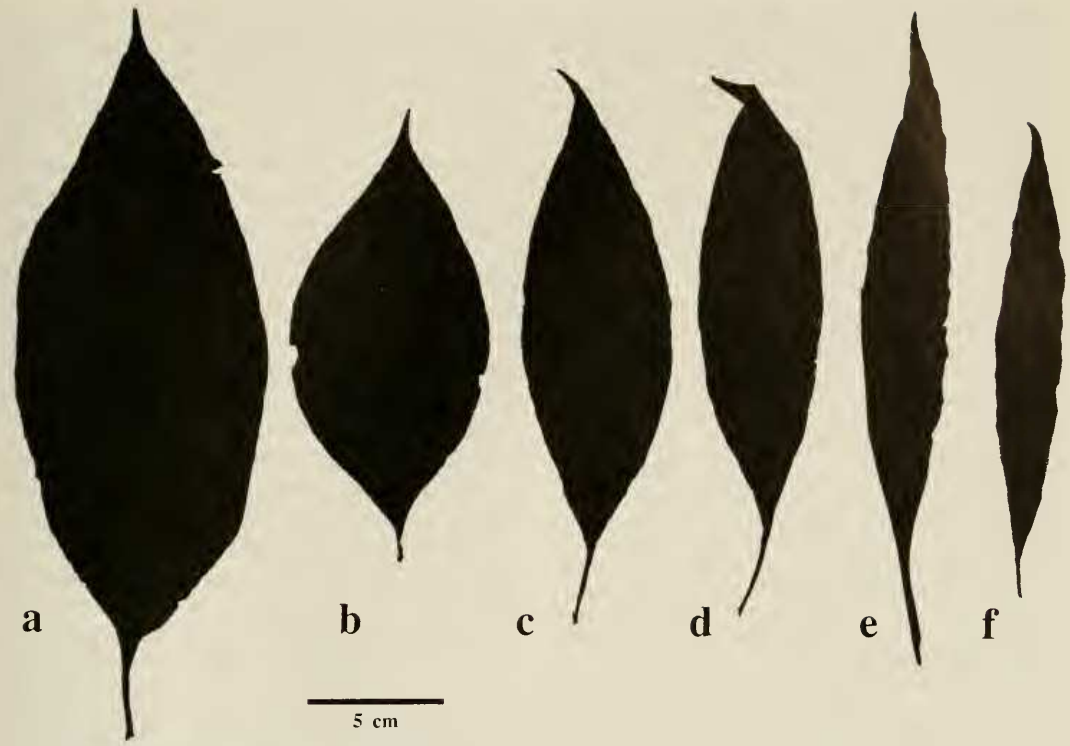



FIGURE 6. Leaf variation among Mexican specimens of *A. aurantiaca.* a, *Daniel & Wendt 5808* (Veracruz); b, *Nava Z. s.n.* (Veracruz); c, *Hernández G. 1591* (Oaxaca); d, *Calzada 59* (Veracruz); e, *Hernández G. 1463* (Oaxaca); f, *Hernández G. 1463* (Oaxaca). All leaves are from one of the distalmost three nodes.

those described as *A. fascinator* Linden & André) and is noted below for *A. speciosa.*

*Aphelandra aurantiaca* is the second most widely distributed species of the genus and is commonly cultivated for ornament. In Mexico its distribution is limited to regions with abundant rainfall. The species is readily recognizable by the combination of its somewhat flattened young stems and pectinately dentate bracts. There is some variation in corolla and perhaps leaf coloration as noted above, but otherwise, Mexican plants are generally homogeneous. Plants resembling *A. aurantiaca* but with somewhat narrower, sinuately margined leaves were described from Peru as *A. repanda* Nees and from northern Central America as *A aurantiaca* var. *stenophylla* Standley. Wasshausen (1975) treated such plants from Guatemala to Peru as var. *stenophylla,* whereas Gibson (1974) recognized them as *A. repanda.* Standley (1929) noted that narrow-leaved plants frequently occur with broader leaved ones and that "intermediate forms" were not encountered in various localities where the two were growing together. Indeed, the narrow-leaved plants appear to be a sporadic form that occurs with the more typical form throughout the range of the species. Therefore it is not surprising that narrow-leaved individuals have recently been collected in Mexico as well (e.g., *Hernández G. 1463*). Figure 6 illustrates some of the variation in leaf form among Mexican specimens of *A. aurantiaca.* Such variation is suggestive of a continuum within a single species.

REPRESENTATIVE SPECIMENS EXAMINED.—MEXICO. **Chiapas:** Mpio. Rayon, 10 km above Rayon Mezcalapa along rd. to Jitotol, *D. Breedlove 26116* (DS); Mpio. Solosuchiapa, 3–5 km above Solosuchiapa along rd. to Tapilula, *D. Breedlove 26460* (DS, MO); Mpio. Berriozábal, 13 km N of Berriozábal near Pozo Turipache and Finca El Suspiro, *D. Breedlove 31250* (DS); Mpio. Palenque, vicinity of Agua Azul, *D. Breedlove & F. Almeda 57256* (CAS); Mpio. Palenque, 6–12 km S of Palenque on rd. to Ocosingo, *D. Breedlove & R. Dressler 29788* (DS, MEXU); Mpio. La Libertad, 15–20 km toward Chancala on rd. to Bonampak from the Palenque-Ocosingo rd., *D. Breedlove 49151* (CAS, TEX); Mpio. Chilon, along rd. to Pozo Cuevas above Agua Azul, *D. Breedlove & F. Almeda 57212* (CAS); Mpio. La Trinitaria, KM 21–23 along rd. from Lago Tzicao to Santa Elena, *D. Breedlove & T. Daniel 71287* (C, CAS, K,

MEXU, MO, NY, TEX); Mpio. Ocosingo, Arroyo Nayte, 8 km NE de Crucero Corozal, camino Palenque-Boca Lacantum, *E. Martínez S. 8484* (MEXU, NY); Cerro Tres Picos, N.O. Simojobel, *F. Miranda 5661* (MEXU); between Tumbala and El Salto, *E. Nelson 3377* (US). Oaxaca: 10 mi from Huajuapan de León toward Tehuacán, *R. Barr & Dennis 65–373A* (ARIZ); Chinantla près Lacoba, *H. Galeotti 914* (BR); Lalana, *H. Galeotti 946* (BR, G, P, W); Mpio. Santa María Chimalapa, Arroyo Milagrito, ca. 6 km SE de Sta. María, *H. Hernández G. 440* (CAS, CHAPA); Mpio. Sta. María Chimalapa, Arroyo Monte Rico, ca. 18 km E de Sta. María, 16°55′N, 94°34′W, *H. Hernández G. & C. González L. 1591* (CAS); Lobani, Chinantla, *F. Liebmann 10603* (C), *s.n.* (K); San Pedro Tepinapa, Chinantla, *F. Liebmann 10604* (C); Comaltepeq, *F. Liebmann s.n.* (K); entre Puerto Eligio a Comaltepec, KM 153 entre Tuxtepec a Oaxaca S. Juarez, *G. Martínez C. 397* (DS, F, MEXU, MICH, UC, US). **Tabasco:** Mpio. Teapa, KM 4 de la carr. Teapa-Tapijulapa, *M. Magaña & S. Zamudio 987* (MO); Teapa, *J. Linden 177* (G, K, P), *540* (BR, G); Mpio. Teapa, El Madrigal, *F. Ventura A. 20990* (MEXU), *F. Ventura A. 21223* (CHAPA). **Veracruz:** Sierra de Tuxtla, 4 mi ENE of Tapalapa, *R. Andrle 87* (US); Mpio. Catemaco, lado NE de Lago Catemaco en cerros al E de Coyame, *J. Beaman 5195* (CAS, F, MEXU, US); Valle de Cordova, *E. Bourgeau 1998* (BR, C, K, P, US); Estación de Biología Tropical Los Tuxtlas, *J. Calzada 59* (CAS, F, MEXU, MICH, US); Mpio. Minatitlán, Zona de Uxpanapa, 13.7 km E of La Laguna toward Uxpanapa, then 6.5 km N toward Belisario Domínguez, *T. Daniel & T. Wendt 5808* (CAS, CHAPA); Estación de Biología Tropical Los Tuxtlas, UNAM camino a la Laguna Escondida, 18°35′N, 95°01′W, *M. Dillon et al. 1781* (F, US), *A. Villegas H. 29* (F); between Sontecomapan and Montepio, *A. Faberge s.n.* (MEXU, TEX); Playa Escondida, *B. Hawkins 102* (MIN); Est. Biol., Sontecomapa, *R. Hernández et al. 483* (DS, LL, MEXU, MO, NY, US); Catemaco, *T. MacDougall 31* (US); Buena Vista, Catemaco, *T. MacDougall 564.S* (F, MICH, NY), *s.n.* (US); Est. Biol. San Andrés Tuxtla, *G. Martínez C. 1774* (CAS, CHAPA, F, MEXU, MICH, MO, US), *2198* (F); 5.7–6 mi from Catemaco on rd. to Sontecomapan, *H. Moore & G. Bunting 8930* (UC, US); Cordova, *F. Müller 2189* (NY), *2215* (NY, W); Mpio. Hidalgotitlán, Río Solosúchil, 2–3 km SE of Augustín Melgar, 17°14′N, 94°33′W, *M. Nee & K. Taylor 29945* (F); Mpio. San Andrés Tuxtla, Balzapote, *G. Shapiro 262* (MEXU); El Vijía de Santiago Tuxtla, *M. Sousa 2580* (MEXU); al pie del Cerro Cochinitos, muy cerco de Coyame, al NE de la Laguna de Catemaco, *M. Sousa & M. de Sousa 94* (CAS, MEXU, US); Mpio. Santiago Tuxtla, Loma Quemada, *F. Ventura A. 14894* (MA), *15612* (MEXU); La Sierra de Lobardia, vic. of Ejido de Pueblo Nuevo, 15–25 km N of Campo Exp. de Hule, El Palmar, Zongolica, *J. Vera S. 2370* (MICH); Mpio. Hidalgotitlán, Manchon al N del Capamento La Laguna, 17°17′N, 94°30′W, *T. Wendt et al. 2725* (CAS, TEX). Country Undermined.—Nueva Espagna, *J. Mociño & M. Sessé s.n.* (OXF); without locality, *M. Sessé & J. Mociño 281* (F, MA).

**4. Aphelandra speciosa** T. Brandegee, Univ. Calif. Publ. Bot. 6:196. 1915. Type.—MEXICO. **Chiapas:** Finca Mexiquito, July 1913, *C. Purpus 6995* (Holotype: UC!; isotypes: see discussion).

Shrub to 4 m tall. Young stems terete to quadrate or somewhat flattened, glabrous or sparsely pubescent with antrorse eglandular trichomes 0.2–0.3 mm long. Leaves opposite, petiolate, petioles to 140 mm long (naked portion to 135 mm), blades ovate-elliptic to elliptic to obovate-elliptic, 135–340 mm long, 32–140 mm wide, 1.8–4.9 times longer than wide, acuminate to subfalcate at apex, (acute to) gradually attenuate at base, surfaces glabrous or nearly so, margin entire. Spikes terminal, elongate, up to 210 mm long (excluding flowers), 30–70 mm in diameter (excluding flowers) near midspike, rachis glabrous. Bracts reddish, arching away from rachis, elliptic to obovate, 26–45(–55) mm long, 15–30 mm wide, 1.3–2.1 times longer than wide, abruptly apiculate (to cirrhous) at apex with apiculum usually reflexed-coiled (except on lowermost bracts) and often breaking off, abaxial surface glabrous, margin sparsely ciliate with straight to flexuose eglandular and glandular trichomes 0.1–0.5 mm long or becoming glabrate, entire or rarely irregularly and inconspicuously toothed with 1–2 teeth (0.1–0.3 mm long) per side. Bractlets lanceolate, 9–18 mm long, 1.7–2.8 mm wide, attenuate at apex, abaxial surface glabrous. Calyx 13–17 mm long, lobes linear to lanceolate, 2.8–3.9 mm wide at base, abruptly acuminate at apex, abaxial surface glabrous. Corolla red, 55–62 mm long, externally glabrous (Mexican specimens, see discussion below), upper lip 17–22 mm long, entire at apex, margin apprently flared along most of the vertical sides, lower lip apparently somewhat reflexed, 19–27 mm long, lateral lobes obovate, 10–14 mm long, 4.5–5.5 mm wide, lower-central lobe elliptic 19–26 mm long, 10–14 mm wide, 1.7–2 times longer and 2.8–2.9 times wider than lateral lobes. Stamens 45–55 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments proximally pubescent with filamentous eglandular trichomes, distally glabrous, thecae 6–8 mm long, pairs presented at ca. same height, apically glabrous, posterior pair often dorsally pubescent; staminode 15 mm long, pubescent. Style 54-58 mm long, glabrous; stigma symmetrically funnelform, 02.–0.3 mm long. Capsule 18–23 mm long, glabrous, punctate-pitted. Seeds somewhat flattened, subelliptic, 5.2–7.5 mm long, 4.2–5.5 mm wide, surface covered with subclavate papillae that are prominent on immature seeds and become less so or mostly restricted to margin on mature seeds.

Distribution and Habitat.—Southern Mexico (Chiapas; Fig. 7) and Guatemala; plants occur in regions of wet forest at elevations from 900 to 1,800 m.


FIGURE 7. Distribution of *Aphelandra guerrerensis, A. lineariloba, A. speciosa,* and *A. wendtii* in Mexico.

PHENOLOGY.—Flowering: May-October and January; fruiting: March, July, August, October.

LOCAL NAMES.—"Flor de mayo" (Gibson 1974, Guatemala); "flor de la Santa Cruz de Mayo" (Gibson 1974, Guatemala).

The locality provided on *Purpus 6995* at the herbaria cited below is given as Finca Irlanda and the date of collection as June 1914. Because the locality and date are at variance with the holotype at UC, these specimens may not represent isotypes. Sousa S. (1969) noted that these localities are different and that Purpus collected at Finca Mexiquito (15°06'N, 92°16'W) during June through September of 1913 and at Finca Irlanda (15°09'N, 92°19'W) during August through September of 1913 and May through June and September of 1914.

The above description includes information from Central American collections as well as those from Mexico. Although there are few collections of this species with well preserved flowers, some variation in corolla pubescence was noted. Corollas of *Skutch 1496* have glands up to 0.2 mm long on the abaxial surface of the lower lip. *Walker 448* has a few sparse eglandular and glandular trichomes on the lower lip. Both of these collections are from Guatemala. Other collections from Guatemala and Mexico with corollas appear to have glabrous lower lips. Variability in leaf coloration was observed in a population of this species in Guatemala. Skutch noted on his flowering collection *1496* that the midvein and the basal portion of the secondary veins were white. This coloration is still evident on the dried specimen. On his subsequent collection (*1538*) of fruiting material from this population a few days later, he noted that the white coloration was no longer evident.

Possible relatives of *A. speciosa* are unknown. The species, with its bracts that are brightly colored, leathery in texture, arching away from the rachis, apically apiculate to cirrhous, and abaxially essentially glabrous, is morphologically unlike other species from Mexico and northern Central America. Species from southern Central America and South America with a superficial resemblance (e.g., large leathery bracts) to *A. speciosa* include: *A. darienensis* Wassh., *A. hirta* (Klotzsch) Wassh., *A. liboniana* Linden ex Hooker, and *A. martiusii* Wassh.

ADDITIONAL SPECIMENS EXAMINED.—GUATEMALA. **Quezaltenango:** 3 km S. of Sta. María Planta Eléctrica on Hwy. 9s, 14°40'N, 91°30'W, *K. Roe et al. 720* (US); Finca St. John, ca. 5 km S of Sta. María de Jesus on slopes of Volcán Sta. María,

*J. Walker 448* (GH). **San Marcos:** La Trinidad, ca. 2 km from Finca Armeria above San Rafael, *T. Croat 40837* (MEXU); Canjutz, *G. Salas 16* (US). **Suchitepequez:** Finca Moca, *A. Skutch 1496* (A, US). *1538* (A, US); Volcán Santa Clara, 1.5–2 mi W of Finca El Naranjo, *J. Steyermark 46800* (US). MEXICO. **Chiapas:** El Mango, Guatimoc, Cacaohoatan, *R. Hernández M. 2354* (MEXU); Corcega, Pueblo Nuevo Com., *E. Matuda 17656* (DS, F, MEXU); Finca Irlanda, *C. Purpus 6995* (A, BM, F, GH, MO, NY, US); Finca Irlanda, Soconusco, *H. G. 11* (DS), *16* (DS).

**5. Aphelandra lineariloba** Leonard, Kew Bull. 1938:63. 1938. TYPE.—MEXICO. **México:** Distr. Temascaltepec, Villaneda, 22 February 1935, *G. Hinton et al. 7412* (Holotype: K!; isotypes: ARIZ!, BM!, F!, G!, GH!, MO!, NY!, US!).

Erect branched shrub or small tree to 3 m tall. Young stems terete to subquadrate-fluted, pustulate (i.e., with protruding blisterlike lenticels), glabrous or distally pubescent with ascendant-appressed eglandular trichomes to 0.4 mm long. Leaves opposite, petiolate, petioles to 120 mm long (naked portion to 50 mm long), blades elliptic to ovate, 50–200 mm long, 18–105 mm wide, 1.7–2.4 times longer than wide, acuminate to falcate at apex, gradually to abruptly attenuate-decurrent (often nearly to node) at base, surfaces pubescent with antrorse eglandular trichomes (especially along major veins), margin entire to subcrenate. Spikes terminal (and sometimes in axils of distal leaves as well), elongate, up to 300 mm long (excluding flowers), 18–30 mm in diameter (excluding flowers) near midspike, rachis pubescent with straight to flexuose eglandular and glandular trichomes 0.05–0.5 mm long. Bracts reddish with green veins, sometimes spreading with age, obovate to elliptic to subcircular, 13–25 mm long, 7–14 mm wide, 1.6–2.3 times longer than wide, acute-mucronate and erect at apex, abaxial surface and margin pubescent like rachis, margin entire (or sometimes with a tooth to 0.4 mm long along 1 or both sides). Bractlets lanceolate to lance-subulate, 7–13 mm long, 1–2.5 mm wide, aristate at apex, abaxial surface pubescent like bracts. Calyx 10–15 mm long, lobes lanceolate, 1.5–3.5 mm wide at base, subaristate to aristate at apex, abaxial surface pubescent like bracts. Corolla reddish (proximal portion of corolla tube greenish yellow, distal portion of tube reddish, throat and external surface of lips faded red to cream, limb internally maroon except pale red to cream at apices of lips), 30–42 mm long, externally pubescent with glandular and eglandular trichomes 0.05–0.2(–0.5) mm long, upper lip 6–13 mm long, entire or bilobed with rounded lobes 0.5–1 mm long at apex, margin not flared, lower lip at first ± perpendicular to upper lip, soon reflexed, 3.5–9 mm long, lateral lobes linear, 2.5–8 mm long, 0.6–1 mm wide, eventually withering during anthesis, lower-central lobe linear, 3–9 mm long, 0.8–2 mm wide, 1.2–1.3 times longer and 1.3–2.2 times wider than lateral lobes. Stamens 27–32 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments pubescent (at least proximally) with filamentous eglandular trichomes, anterior pair also distally pubescent with conspicuously flattened eglandular trichomes, thecae 2–3 mm long, pairs presented at ca. same height, all apically (and posterior pair dorsally) pubescent with cobwebby eglandular trichomes; staminode a triangular callous 0.3 mm long. Style 30–35 mm long, pubescent with eglandular trichomes proximally and becoming glabrous distally; stigma unequally bilobed with 1 lobe 1.5–2 mm long and the other 0.4–0.6 mm long. Capsule 14–18 mm long, pubescent with mostly straight eglandular trichomes 0.1–0.2 mm long. Seeds flattened, subcircular, 3–4.5 mm long, 2.7–3 mm wide, pubescent with stiff, simple to dendritic trichomes 0.1–0.2 mm long. (Fig. 8).

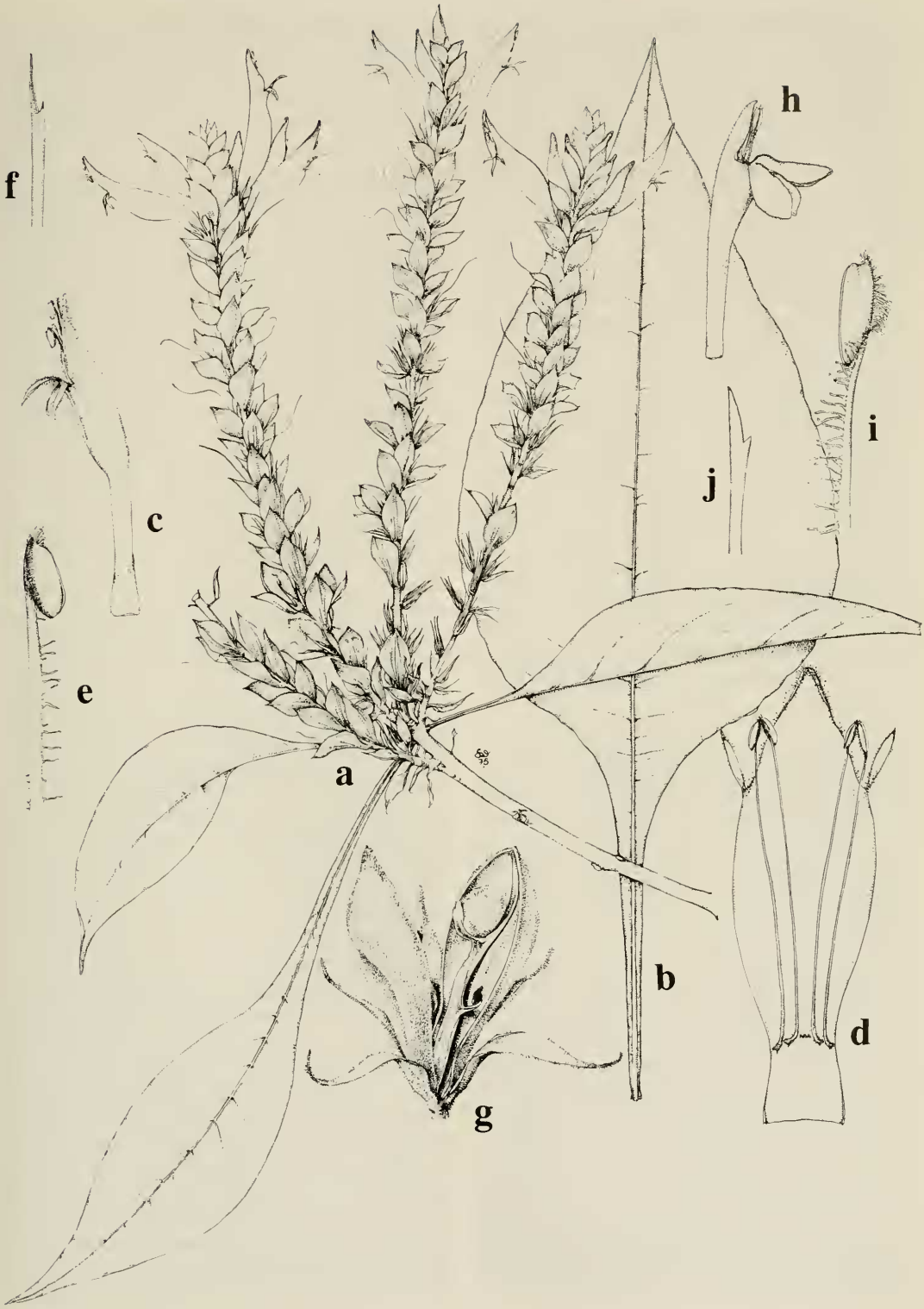
DISTRIBUTION AND HABITAT.—West-central Mexico (Jalisco, Colima, Michoacán, México, and Guerrero; Fig. 7); plants occur in rocky canyons in regions of tropical subdeciduous forest, oak forest, and pine-oak forest at elevations from 150 to 1,300 m.

PHENOLOGY.—Flowering: December–March; fruiting: December–April.

*Aphelandra lineariloba* and *A. madrensis* both

→

FIGURE 8. *Aphelandra lineariloba* (a–e, *McVaugh & Koelz 1751*) and *A. madrensis* (h–j, *Feddema 2568*). a, Branch with spikes, ×0.5; b, Leaf, ×0.5; c, Flower with calyx removed, ×1; d, Corolla (with lower-central lobe removed) cut open to reveal androecium, ×1.5; e, Distal portion of stamen, ×5; f, Distal portion of style with stigma, ×5; g, calyx and capsule, ×2; h, Flower with calyx removed, ×1; i, Distal portion of stamen, ×5; j, Distal portion of style with stigma, ×5. Drawn by Karin Douthit for McVaugh's *Flora Novo-Galiciana*; copyright reserved to the University of Michigan Herbarium, used with permission.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occur in west-central Mexico, flower during the dry season, and share a combination of morphological attributes that readily distinguishes them from all other Mexican species of the genus. These morphological features include discolorous and relatively short corollas with short lips, elongate and unequally bilobed stigmas, and large, flattened trichomes on the filaments. Because the only mutually exclusive characters that distinguish them from each other all pertain to characters of the flower, the identification of strictly fruiting plants can be problematic. In such instances, the tendency of most individuals of *A. madrensis* from Sinaloa, Nayarit, Jalisco, and Colima to lack glands (or at least to lack conspicuous glands) in the inflorescence (i.e., rachis, bracts, bractlets, calyx, and corolla) is often helpful (see discussion under *A. madrensis*). In contrast, *A. lineariloba* always exhibits conspicuous glands in the inflorescence.

In addition to *A. lineariloba* and *A. madrensis*, only one other species, *A. hintonii*, is known from the Nueva Galicia region of west-central Mexico. Like the former two species, *A. hintonii* has large and conspicuously flattened trichomes on the filaments. Unlike them, however, it has longer calyces, corollas, and thecae (see discussion under *A. hintonii*).

Additional Specimens Examined.—MEXICO. **Colima:** Sierra de Manantlán, Cerro Grande between Juluapan to Los Sauces, 29 km (air) NW of Colima, *T. Cochrane et al. 11722* (IBUG, UCR); 9–10 km ESE of Minatitlán, *R. McVaugh 26224* (MICH). **Guerrero:** Distr. Montes de Oca, Vallecitos, *G. Hinton et al. 11648* (F, GH, K, LL, MO, US); Sierra Madre Sur, Distr. Adama, N of Río Balsas, Temisco, Barranca del Consuelo, *Y. Mexia 8952* (ARIZ, B, CAS, F, G, GH, K, MO, UC, US); Achotla, *B. Reko 5047* (US). **Jalisco:** Mpio. Tuxpan, La Higuera, *A. Alvarez G. 23* (IBUG); along Hwy. 110, 2.2 mi N of Pihuamo, *T. Daniel 2138* (ASU, CAS, MICH), cuttings from this locale grown at San Fransisco Conservatory of Flowers, *T. Daniel 2138cv* (CAS); 3 km S de Pihuamo, *Diaz L. 9406* (ENCB); 21.2 km SW de Atenquique, *E. Lott et al. 985* (ASU, MEXU, MO); hwy, to Autlán, 9 mi N of rd. jct. at W end of Bahía de Navidad, *R. McVaugh & W. Koelz 1751* (MICH); Mpio. Pihuamo, S del rancho El Tule, *B. Mora N. s.n.* (IBUG). **México:** Distr. Temascaltepec, Acatitlán, *G. Hinton 3156* (BM, G, GH, K, MO, US). **Michoacán:** Hacienda Coahuayula, *G. Emrick 52* (F); Distr. Coalcomán, Coalcomán, *G. Hinton et al. 12881* (GH, LL, US), *13623* (F, GH, MO, US); Distr. Coalcomán, Huixontla, *G. Hinton et al. 15794* (B, F, G, K, LL, M, MO, MICH, US, W); 8 km S of Arteaga, *B. Leuenberger & C. Shiers 2708* (B); ca. 45–48 km S of Arteaga, 12–15 km N of Playa Azul, *R. McVaugh 22609* (MICH); ca. 8 km NW of Aguililla, rd. to Aserradero Dos Aguas, *R. McVaugh 22650* (MICH).

**6. Aphelandra madrensis** Lindau, Bull. Herb. Boiss. ser. 2, 4:326. 1904. Type.—MEXICO. **Guerrero:** Sierra Madre, 1,600 m, 27 January 1899, *E. Langlassé 806* (Holotype: B, destroyed; lectotype: P!, designated here; isotypes: G!, GH!, K!, US!).

Branched shrub to 3.5 m tall. Young stems terete to subquadrate, multi-fluted, pubescent with antrorse to ascendant to ascendant-appressed eglandular trichomes to 0.8 mm long or glabrate. Leaves opposite to subopposite, petiolate, petioles to 110 mm long (naked portion to 45 mm long), blades (narrowly elliptic to) ovate to broadly ovate, 55–220 mm long, 20–110 mm wide, 1.6–3.4(–5.2) times longer than wide, acuminate to subfalcate at apex, abruptly to gradually attenuate-decurrent (sometimes nearly to node) at base, surfaces sparsely pubescent (especially along midvein) with eglandular trichomes or glabrate, margin entire to subcrenate. Spikes axillary (in axils of distal leaves) and/or terminal, elongate, up to 155 mm long (excluding flowers), 14–50 mm in diameter (excluding flowers) near midspike, rachis pubescent with ascendant (especially near base of spike) to straight to flexuose eglandular and glandular (sometimes inconspicuous or absent) trichomes 0.1–0.8 mm long. Bracts green proximally and red distally (red coloration often not evident on fruiting individuals), often spreading with age, broadly ovate to ovate to elliptic to obovate-elliptic, 9–30 mm long, (3.5–)5–12(–17) mm wide, (1.3–)1.7–2.9 times longer than wide, rounded (often apiculate) to acute to subacuminate (sometimes mucronate), erect at apex, abaxial surface and margin pubescent with an understory of straight eglandular trichomes 0.05–0.2 mm long and an overstory (sometimes absent) of straight to flexuose eglandular and/or glandular (sometimes inconspicuous or absent) trichomes 0.2–1.2 mm long, margin entire or rarely sporadically and irregularly toothed with 1–2 teeth per side, teeth 0.2–0.5 mm long. Bractlets lanceolate to subulate, (3–)4.5–15 mm long, (0.5–)1.2–1.6 mm wide, attenuate to aristate at apex, pubescent like bracts. Calyx 7–12(–16) mm long, lobes ovate to lanceolate to linear, 1.6–3.3 mm wide at base, acute to acminate to attenuate to subaristate at apex, pubescent like bracts (overstory trichomes often sparse or absent except near apex). Corolla red with limb conspicuously darker than tube, 33–


FIGURE 9. Distribution of *Aphelandra madrensis* and *A. schiedeana* in Mexico.

42 mm long, externally pubescent with eglandular and sometimes glandular trichomes to 1 mm long, glandular trichomes, when present, sometimes restricted to lower lip, upper lip 6.5–11.5 mm long, entire or bilobed with rounded lobes 0.4–0.7 mm long at apex, margin not flared, lower lip ± perpendicular to upper lip, 7–13 mm long, lateral lobes narrowly elliptic to subcircular to obovate, 5.5–12 mm long, 1.8–6 mm wide, lower-central lobe subcircular to broadly elliptic to obovate-elliptic, 6–12.5 mm long, 4–9.5 mm wide, 1–1.7 times longer and 1.4–2.2 times wider than lateral lobes. Stamens 26–31 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, anterior (longer) filaments proximally pubescent with conspicuously flattened and/or filamentous eglandular trichomes, distally pubescent with flattened trichomes, posterior (shorter) filaments proximally pubescent with flattened or filamentous eglandular trichomes, distally glabrous, thecae 2.2–3.7 mm long, anterior pair extended up to 1 mm beyond posterior pair, apically pubescent with cobwebby eglandular trichomes, dorsally pubescent with cobwebby (posterior pair) or flattened (anterior pair) eglandular trichomes; staminode 0.3–0.8 mm long, pubescent. Style 24–33 mm long, pubescent with eglandular (and sometimes glandular) trichomes throughout; stigma unequally bilobed with one lobe 0.05–0.3 mm long and the other 0.5–1.9 mm long. Capsule 12–17.5 mm long, externally pubescent with straight to flexuose to retrorse eglandular trichomes 0.1–0.3 mm long. Seeds flattened, subelliptic to somewhat squarish, 3.5–5 mm long, 3–4.3 mm wide, covered with apically bifurcate or branched to dendritic trichomelike papillae 0.1–0.3 mm long. (Fig. 8).

DISTRIBUTION AND HABITAT.—West-central Mexico (Sinaloa, Nayarit, Jalisco, Colima, Michoacán, and Guerrero; Fig. 9); plants occur in ravines and stream valleys in regions of tropical deciduous, subdecidous, oak, and pine-oak forest at elevations from near sea level to 2,500 meters.

PHENOLOGY.—Flowering: November–March; fruiting November–March.

Locality information provided on the type of *A. madrensis* is not very precise. Between the

13th and 31st of January, 1899, Langlassé traveled from Tecpan to the summit of the Sierra Madre Sur in Guerrero and back by way of the route to Ajuchitlán on the Río Balsas (McVaugh 1951). The type was apparently collected during the descent of the Pacific slope on the return to Tecpan.

The type of *A. medrensis* was collected approximately 300 km southeast of the main portion of the range of the species and differs from most collections from Sinaloa, Nayarit, Jalisco, and Colima in several features including: longer bractlets (12–15 mm vs. 3–8.5 mm ), longer calyces (12–16 mm vs. 7–11 mm), and more glandular corollas (external surface evenly and densely glandular vs. external surface eglandular or with glands restricted to the lower lip only) with the lateral lobes of the lower lip broader (elliptic to subcircular and 5–6 mm wide vs. narrowly elliptic to obovate and 1.8–5.5 mm wide). The type differs even more conspicuously from most of these collections by its conspicuously glandular inflorescences (vs. inconspicuously glandular or eglandular) with thin and membranous textured bracts (vs. thicker and stiffer). However, several collections from the vicinity of Coalcomán in Michoacán either exhibit character states that bridge some of the morphological gaps between the more northerly collections and the type or randomly combine character states from each. For example, in *Hinton et al. 11062* and *12675,* the bractlets vary from 7.5 to 10.5 mm in length and are thus intermediate between the type and the more northerly collections. In most other characters (e.g., calyx length, corolla pubescence, lateral lobe shape and size, and inflorescence pubescence) *Hinton et al. 12675* resembles the northern collections. It has thin, membranous bracts like those of the type, however. *Hinton et al. 11062* resembles *Hinton et al. 12675* in most of these features except it has thicker and stiffer bracts. *Hinton et al. 16062* resembles the northern collections in its pubescence and lateral corolla lobes, resembles the type in length of the calyces, and is intermediate between the two in bractlet length and bract texture. *Hinton et al. 15912* and *16042* have prominent glandular trichomes throughout the inflorescence and on the entire external surface of the corolla, bractlets 7–10 mm long, calyces 10.5–12 mm long, elliptic to obovate lateral corolla lobes 4–4.8 mm wide, and membranous- to stiff-textured bracts.

Further studies may reveal that the northern populations represent a taxon other than that represented by the type of *A. madrensis.* Considering the overlap in character states noted above and the lack of any collections from Guerrero since that of Langlassé, it seems premature to propose such at this time. It is not known whether Hinton's series of collections from Michoacán represents hybrids between two such similar taxa or merely local variation in a wide-ranging species.

The most morphologically similar species, and undoubtedly the closest relative of *A. madrensis,* is *A. lineariloba,* which is also endemic to western Mexico. Further consideration of these species is provided in the discussion of the latter.

Representative Specimens Examined.—MEXICO. **Colima:** Mpio. Tecomán, Tecolapa, Cerro el Alcomun, *F. Leger 1033* (CAS, IBUG); 13–15 km W of Santiago, *R. McVaugh 25026* (MICH); gorge of Río Cihuatlán (Moravasco), rd. to Durazno, Jalisco, 13 mi N of Santiago, *R. McVaugh & W. Koelz 1652* (MICH). **Jalisco:** N end of Valley of Purification, KM 228 on Hwy. 100, SW of Autlán, *R. Alva & S. Cook 1677* (UC); Sierra de Manantlán, Sn. Miguel, *O. Angel R. s.n.* (IBUG); ca. 19 km S of Puerto Vallarta toward Tuito, *T. Croat 45415* (MO); Cuautitlán, 2–3 km NW de Telcruz, 50 km NW de Colima, 19°29′N, 104°8′W, *R. Cuevas & G. Nieves 2141* (IBUG); 20.9–23.7 mi NE of La Huerta and 11.9–14.7 mi SW of turn to Ahuacapan S of Autlán, *T. Daniel 2114* (ASU, CAS, MICH, UCR); 20.1–22.9 km S of Talpa de Allende toward La Cuesta, *T. Daniel 5251* (CAS); along Hwy. 80, 14.1 km N jct. Hwys. 80 and 200 near Melaque, *T. Daniel 5276* (C, CAS, IBUG, K, MEXU, TEX); ca. 3 km NE of Puerto Vallarta, upriver from Playa Grande, *C. Feddema 2568* (MICH); 10 km NE of Puerto Vallarta near Milagro on rd. to Mascota, *C. Feddema 2590* (MICH); 18 km ESE of Tomatlán, 19°53′N, 105°05′W, *H. Iltis & M. Nee 1640* (US); Sierra Manantlán, ca. 9 km N de Casimiro Castillo, 19°41′N, 104°25′W, *E. Judziewicz et al. 5173* (US); 29 km SW de Autlán, carr. a Melaque, ca. 4 km N de Ejido El Rincon, *E. Lott & J. Magallanes 865* (CAS, CHAPA, TEX); 6–10 mi SW of Talpa de Allende, above Aranjués in valley of Río Charco Verde, *R. McVaugh 14345* (MICH); Mpio. Tomatlán, 5 km NE of Piloto, *R. McVaugh 25449* (MICH); Sierra del Halo, 7–9 mi from Colima-Tecalitlán hwy. near lumber rd. leaving hwy. 7 mi SSW of Tecalitlán, *R. McVaugh & W. Koelz 1266* (MICH); S of Puerto Vallarta near seashore, *Y. Mexia 1134* (CAS, E, F, MICH, UC, US); Santa Cruz de Vallarta, *Y. Mexia 1259* (BM, DS, US); Mpio. Casimiro Catillo, 4 km NE de El Zapotillo, *F. Santana M. 2540* (IBUG); 3 km adelante de Los Mazos, entre Autlán y Casimiro Castillo, *F. Santana M. & Cházaro B. 2649* (MEXU); camino de las matequillas a la Cascada de las Juntas, Las Loyas, Autlán, *A. Vasquez 3759* (MEXU). **Michoacán:** Distr. Coalcomán, Aquila, *G. Hinton et al. 11062* (US), *16042* (US), *16062* (K, LL, MICH); Distr. Coalcomán, S. Naranjillo, *G. Hinton et al. 12675* (DS, K, US); Distr. Coalcomán, Tizupan, *G. Hinton et al. 15912* (US); Mpio. Coahuayana, rd. summit between San Telmo and San Juan de lima, *J. MacDougal & J. Miley 494* (DUKE, IBUG). **Nayarit:** 8 km N of Real de Zopilote on rd. to San

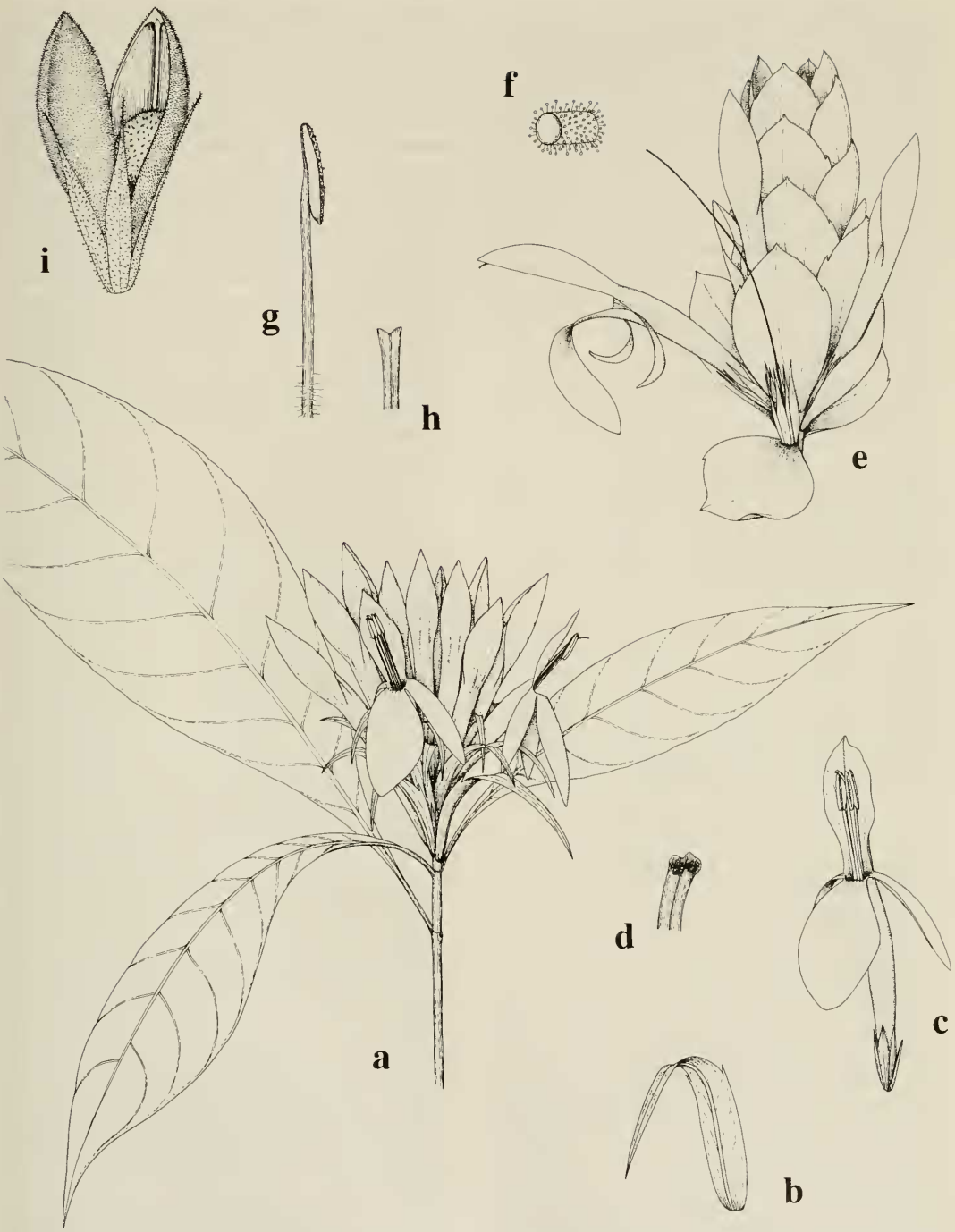


FIGURE 10. *Aphelandra wendtii* (a–d) and *A. gigantiflora* (e–i). a, Habit, ×0.5 (based on *Breedlove 47343* and *28856*); b, Bract, ×1.1 (*Breedlove 47343*); c, Flower with one bractlet, ×0.8 (*Breedlove 52540*); d, Distal portion of style with stigma, ×9 (*Breedlove 22247*); e, Spike, ×0.9 (*Breedlove & Almeda 60161*); f, Spike rachis, ×2.5 (*Breedlove & Almeda 60161*); g, Stamen, ×3.8 (*Croat 46289*); h, Distal portion of style with stigma, ×11 (*Croat 46289*); i, Calyx, capsule, and seed, ×1.8 (*Croat 46289*). Drawn by Mary Ann Tenorio.

Pedro, *D. Breedlove & F. Almeda 60706* (CAS, US); 9 mi N of Compostela, *R. McVaugh & W. Koelz 532* (MICH); 10 mi SE of Ahuacatlán on rd. to Barranca del Oro and Amatlán, *R. McVaugh & W. Koelz 758* (MICH); Mpio. Valle de Banderas, 1 km N de El Cuatante, *J. Rzedowski 17871* (MICH). **Sinaloa:** along Hwy. 40, 25.5 mi E of Concordia, *D. Breedlove 4241* (DS, DUKE, MICH); Sierra Tacuichamona, Africa, *H. Gentry 5655* (ARIZ); Mpio. Cosalá, Mineral de Nuestra Señora, *F. Hernández A. & J. Hernández V. 513* (MEXU); Sierra de Pinal, just E of El Espinal, *M. Kimnach & H. Sanchez M. 2261* (CAS, US); Sierra Madre, cañón near Santa Lucia, *Y. Mexia 421* (CAS, UC); Mpio. San Ignacio, Balboa, *J. Ortega 1161* (MEXU), *5023* (US); Sierra Madre Occidental, along Hwy, 40, 0.6 mi above El Cantil and 21 mi NE of Concordia, *A. Sanders et al. 4573* (ARIZ, CAS, UCR); Mpio. Culiacán, entre Sanalona y Los Mayos, rumbo a Tamazula, *R. Vega & F. Hernández 2260* (MEXU).

### 7. **Aphelandra wendtii** T. F. Daniel, sp. nov. (Fig. 10).

Type.—MEXICO. **Veracruz:** Mpio. Hidalgotitlán, Zona de Uxpanapa, along rd. to Poblado 10, NE of La Laguna and E of Río Cuevas, 15 October 1988, *T. Daniel & T. Wendt 5813* (Holotype: CAS!; isotypes: C!, CHAPA!, DUKE!, ENCB!, K!, MEXU!, MICH!, MO!, US!).

Frutex usque ad 3 m altus. Folia opposita, laminae ovatae-ellipticae vel ellipticae basi in petiolum decurrentes. Spicae plerumque subcapitatae (raro elongatae) 40–65 mm diametro ad medium. Bracteae virides lanceolatae vel ligulatae 28–58(–65) mm longae 5–12 mm latae 5–11–plo longiores quam latiores apice sensim attenuate patentes vel reflexae margine plerumque dentate, pagina abaxialis pubescens trichomatibus glandulosis et/vel eglandulosis vel fere glabrata. Corolla rubra 55–74 mm longa extus glandulosa, labium inferum lobis lateralibus obovatis vel ellipticis 17–25 mm longis 5–7.5 mm latis lobo centrali obovato vel elliptico vel subcirculari lobis lateralibus 1.1–1.4–plo longiore et 2–2.5–plo latiore. Thecae 6.5–8.1 mm longae pubescentes. Stigma infundibuliforme 0.2–0.3 mm longum. Capsula ignota.

Branched shrub to 3 m tall. Young stems terete to quadrate, sparsely pubescent with (flexuose to) antrorse to antrorse-appressed eglandular trichomes 0.4–1 mm long, soon glabrate. Leaves opposite, petiolate, petioles to 95 mm long (naked portion to 40 mm long), blades ovate-elliptic to elliptic, 120–280 mm long, 34–100 mm wide, 1.9–5.6 times longer than wide, acuminate to subfalcate at apex, gradually to somewhat abruptly attenuate-decurrent (often to node at base, surfaces sparsely pubescent with cauline type trichomes to glabrate, margin entire to sinuate-crenate. Spikes terminal, subcapitate (rarely elongate), to 70(–180) mm long (excluding flowers), 40–80 mm in diameter (excluding flowers) near midspike, rachis pubescent with antrorse eglandular trichomes to 1 mm long. Bracts green, lanceolate to strap-shaped, 28–58(–65) mm long, 5–12 mm wide, 5–11 times longer than wide, distal portion conspicuously spreading or reflexed, gradually attenuate at apex, abaxial surface pubsecent with flexuose to antrorse-appressed eglandular trichomes to 1 mm long and sometimes with straight to flexuose, shorter, glandular trichomes or nearly glabrate, margin ciliate with trichomes like those of abaxial surface, dentate with 1(–2) teeth (sometimes obscure or absent) per side, teeth 0.2–3(–4.5) mm long. Bractlets subulate to lance-subulate, 9.5–16 mm long, 0.5–1.5 mm wide, apically aristate, pubescent like bracts. Calyx 11–16.5 mm long, lobes lanceolate, 2–3.5 mm wide at base, attenuate to subaristate at apex, abaxial surface pubescent with antrorse eglandular trichomes to 0.3 mm long. Corolla red, 55–74 mm long, externally pubescent with glandular and eglandular trichomes to 1.5 mm long, upper lip 20–32 mm long, entire to emarginate with rounded lobes 1–2.5 mm long to irregularly toothed with 1–2 coarse teeth along distal margin at apex, margin flared to reflexed proximally, lower lip ± perpendicular to upper lip, 17–35 mm long, lateral lobes obovate to elliptic, 17–25 mm long, 5–7.5 mm wide, lower-central lobe obovate to elliptic to subcircular, 23–34 mm long, 9–19 mm wide, 1.1–1.4 times longer and 2–2.5 times wider than lateral lobes. Stamens 45–62 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments pubescent proximally or throughout with filamentous eglandular trichomes, sometimes glabrous distally, thecae 6.5–8.1 mm long, pairs presented at ca. same height or posterior pair extending up to 1 mm beyond anterior pair, all 4 apically (and posterior pair dorsally) pubescent with cobwebby eglandular trichomes; staminode 0.3–18 mm long, pubescent. Style 53–65 mm long, pubescent with eglandular trichomes throughout; stigma symmetrically funnelform, 0.2–0.3 mm long. Capsule 19–20 mm long, glabrous. Seeds flattened, subcircular to subelliptic in outline, 4–4.5 mm long, 3.2–3.5 mm wide, surface covered with stiff, often apically branched or barbed trichome-like papillae.

Distribution and Habitat.—Southern Mexico (Chiapas, Tabasco, and Vercruz; Fig. 7); plants occur in lowland to montane rain forest at elevations from 140 to 1,200 m.

Phenology.—Flowering: July–January. Fruiting: December.

Two collections, the type from southeastern-most Veracruz and *Torres C. et al. 2081* from Chiapas, have bracts with entire margins. All other collections have inflorescences with at least some of the bracts dentate. Similar variation in bracteal margin is evident in other Mexican species of *Aphelandra.*

*Aphelandra wendtii* has been confused with, and is undoubtedly most closely related to, *A. heydeana.* Many of the collections cited below have been annotated as the latter species. For example, *Nelson 3302* was annotated by Dorothy Gibson as *A. heydeana* and was the sole basis for Wasshausen's (1975) inclusion of the species in Mexico. Although *A. heydeana* is now known from Mexico based on other collections, Nelson's collection pertains to *A. wendtii.* These two species can be distinguished by the features in the following couplet:

Inflorescence elongate, 19–35 mm in diameter (excluding flowers) near midspike; bracts lanceovate to obovate-elliptic, 14–26 mm long, 2.2–4 times longer than wide, apex attenuate-caudate to caudate; lateral lobes of lower lip of corolla linear to oblanceolate, 5–16 mm long, 0.5–5 mm wide; lower-central lobe of corolla 1.6–4.5 times longer and 3.6–28 times wider than lateral lobes; pollen with 3-armed polar apertures ..... *A. heydeana.*

Inflorescnece subcapitate (rarely elongate), 40–80 mm in diameter (excluding flowers) near midspike; bracts lanceolate to strap-shaped, 28–65 mm long, 5–11 times longer than wide, apex gradually attenuate; lateral lobes of lower lip of corolla obovate to elliptic, 17–25 mm long, 5–7.5 mm wide; lower-central lobe of corolla 1.1–1.4 times longer and 2–2.5 times wider than lateral lobes; pollen lacking polar apertures. ..... *A. wendtii.*

In addition to these morphological distinctions, there appear to be ecological and geographical differences between the two taxa as well. *Aphelandra wendtii* is primarily a lowland, rain forest species restricted to the Gulf slope whereas *A. heydeana* is a highland species of pine and/or oak forests on the Pacific slope.

This species is named in honor of Dr. Tom Wendt, co-collector of the type, whose excellent series of collections from the Uxpanapa Region has significantly increased knowledge of the Mexican rain forests.

PARATYPES.—MEXICO. **Chiapas:** Mpio. Palenque, 8–9 km S of Palenque on rd. to Ocosingo, *D. Breedlove 26524* (DS, ENCB, LL), *28856* (DS), *D. Breedlove & J. Strother 46900* (CAS); Mpio. Palenque, 50 km SW of Palenque on rd. to Ocosingo near Colonia Ursulo Galvano, *D. Breedlove 47343* (CAS, DUKE, NY); Mpio. Ocosingo, 70 km SW of Palenque on rd. to Ocosingo along the Jol Uk'um, *D. Breedlove 52540* (CAS), *D. Breedlove & F. Almeda 48406* (CAS); Mpio. Chilon, along rd. to Pozo Cuevas above Agua Azul, *D. Breedlove & F. Almeda 57214* (CAS); Mpio. Ocosingo, 6–8 km N of Ocosingo along rd. to Bachajon, *D. Breedlove & A. Smith 22121* (DS, DUKE, ENCB); Mpio. Yajalon, below Yajalon, *D. Breedlove & A. Smith 22247* (DS); Mpio. Chontal, Villa Paraíso, 136 km NE of San Cristóbal de las Casas toward Palenque, 17°29′N, 92°05′W, *B. Hammel et al. 15650* (CAS, MO); 19.2 km from turn to ruins on rd. from Palenque to Ocosingo via Cascada Misolha, *M. Hufi & E. Cabrera 2413* (MO); Palenque Ruins, *B. Marcks & C. Marcks 959* (LL); Mpio. Ocosingo, 2 km N de Naja camino a Palenque, *E. Martínez S. & W. Stevens 23976* (CAS); near Tumbala, *E. Nelson 3302* (US); Cascadas Mizola, W side of Palenque-Ocosingo rd., ca. 10 mi S of Palenque, *A. Reznicek & D. Gregory 297* (MICH); Mpio. del Salto, carr. Ocosingo-Palenque, 11 km N de Jerusalén (Ruíz Cortinez), *R. Torres C. et al. 2081* (MEXU); Mpio. Yajalon, 67 km S de Palenque, carr. (#199) a Ocosingo, 3.2 km S de Xanil, 17°10′N, 92°09′W, *T. Wendt et al. 2336* (CAS). **Tabasco:** Mpio. Macuspana, E end of Cerro Tortugero, 7 km S of Macuspana, *C. Gilly & E. Hernández X. 399* (GH, MICH); Parque Nacional de Agua Blanca, Macuspana, KM 64 carr. Villahermosa-Escárcega, 17°38′N, 92°30′W, *R. Cano D. 6* (CHAPA), *L. Martínez G. et al. 6* (CHAPA).

**8. Aphelandra hintonii** D. Wasshausen, Phytologia 25:476. 1973. TYPE.—MEXICO. **Michoacán:** Distr. Coalcomán, Naranjillo, 30 October 1941, *G. Hinton et al. 16049* (Holotype: US!; isotype: MICH!, NY!).

Shrub of unknown height. Young stems subterete to subquadrate, more or less evenly pubescent near apex with flexuose to ascendant eglandular trichomes 0.3–1 mm long, these soon becoming concentrated in 2 lines, mature stems glabrate. Leaves opposite to subopposite, petiolate, petioles to 120 mm long (naked portion to 35 mm long), blades ovate, 80–180 mm long, 45–125 mm wide, 1.6–2 times longer than wide, acute to acuminate at apex, gradually to abruptly attenuate-decurrent (often nearly to node) at base, surfaces pubescent with cauline type trichomes, margin entire to subcrenate. Spikes terminal, more or less elongate, up to 90 mm long (excluding flowers), 50–65 mm in diameter (excluding flowers) near midspike, rachis densely pubescent with flexuose to antrorsely appressed, silky glandular and eglandular trichomes 0.5–1.5 mm long (sericious). Bracts with a dark coloration distally (in dried material), ovate to obovate, 20–33(–67) mm long, 9–15(–22) mm wide, 1.8–

2.2 times longer than wide, acute to acuminate and erect at apex, surfaces and margin densely sericeous and with straight to flexuose glandular trichomes 0.3–0.7 mm long, margin entire. Bractlets lanceolate, 18–21 mm long, 2.5–4 mm wide, attenuate at apex, abaxial surface glandular-sericeous (with glands up to 1 mm long). Calyx 15–19 mm long, lobes lanceolate, 2–2.5 mm wide at base, attenuate at apex, pubescent like bractlets. Corolla red, 60–80 mm long, externally pubescent with eglandular and glandular trichomes 0.2–0.6 mm long, upper lip 17–22 mm long, entire at apex, margin flared proximally, lower lip ± perpendicular to upper lip, 19–21 mm long, lateral lobes obovate-elliptic, 14 mm long, 4.5–8 mm wide, lower-central lobe broadly elliptic, 18–21 mm long, 14–15 mm wide, 1.2 times longer and 2 times wider than lateral lobes. Stamens 45–60 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments proximally pubescent with filamentous eglandular trichomes, anterior pair distally pubescent with conspicuously flattened eglandular trichomes, posterior pair distally glabrous, thecae 4.5–5.1 mm long, pairs presented at ca. same height, all apically (and posterior pair dorsally) pubescent with cobwebby eglandular trichomes; staminode a triangular callous 0.5 mm long. Style 57 mm long, distally pubescent with eglandular trichomes; stigma bilobed with 1 lobe 0.1 mm long and the other 0.2 mm long. Capsule not seen.

Distribution and Habitat.—West-central Mexico (Michoacán; Fig. 3); plants were collected in "woods" at an unknown elevation.

Phenology.—Flowering: October.

*Aphelandra hintonii* is known only from a single collection from the Nueva Galicia region of western Mexico. It has relatively large flowers, like those of species in southern Mexico, and staminal trichomes similar to the short-flowered species, *A. lineariloba* and *A. madrensis,* that occur in Nueva Galicia. It appears superficially similar to *A. flava* Nees from Colombia in several features, including the large corollas and staminal pubescence. *Aphelandra flava* has yellow corollas, however, and lacks the silky trichomes on the rachis characteristic of *A. hintonii.* Additional collections of *A. hintonii* are desirable in order to more adequately delimit this species, document its overall distribution, and better understand its relationships to other species.

**9. Aphelandra heydeana** J. Donnell-Smith, Bot. Gaz. 18:210. 1893. Type.—GUATEMALA. **Santa Rosa:** Chupadero, October 1892, *E. Heyde & E. Lux 4037* (Holotype: US!; isotypes: G!, GH!, K!, M!, MO!, NY!, P!, US!).

Branched shrub to 1 m tall. Young stems subterete, with blisterlike superficial projections (lenticels), pubescent with antrorse-appressed eglandular trichomes to 0.8 mm long or glabrate. Leaves opposite, petiolate, petioles to 70 mm long (naked portion to 15 mm long), blades ovate to ovate-elliptic, 30–150 mm long, 14–76 mm wide, 1.4–4 times longer than wide, (rounded to) acuminate at apex, abruptly attenuate-decurrent (sometimes to node) at base, surfaces sparsely pubescent with antrorse to antrorse-appressed, eglandular trichomes or glabrate, margin entire to subsinuate. Spikes terminal (and sometimes in axils of distal leaves as well), more or less elongate, up to 70 mm long (excluding flowers), 19–35 mm in diameter (excluding flowers) near midspike, rachis densely pubescent with antrorse to antrorse-appressed eglandular trichomes 0.5–1.5 mm long. Bracts green (sometimes with a darker coloration distally), conduplicate, lanceovate to obovate-elliptic, 14–26 mm long, 3.5–9 mm wide, 2.2–4 times longer than wide, distal portion widely spreading to reflexed, attenuate-caudate to caudate at apex, abaxial surface and margin pubescent with flexuose to appressed eglandular and glandular (sometimes inconspicuous) trichomes 0.1–1.5 mm long, margin dentate with 1–2 teeth (rarely obscure or absent, some always present in an inflorescence) per side, teeth 0.2–3.2 mm long. Bractlets subulate to lance-subulate, 7–11(–14) mm long, 0.8–2 mm wide, aristate at apex, abaxial surface pubescent with mostly antrorse eglandular trichomes. Calyx 9–13 mm long, lobes lanceolate, 2.5–3.5 mm wide at base, attenuate to aristate at apex, abaxial surface inconspicuously pubescent with antrorse eglandular trichomes to 0.2 mm long. Corolla orange-red (with yellow veins on lower lip) to red, 49–68 mm long, externally pubescent with glandular and eglandular trichomes to 1.5 mm long, upper lip 19–27 mm long, entire at apex, margin flared proximally or along most of the vertical sides, lower lip ± perpendicular to upper lip, 18–28 mm long, lateral lobes linear to oblanceolate, 5–16 mm long, 0.5–5 mm wide, lower-central lobe elliptic to obovate, 17–27 mm long, 8–18 mm wide, 1.6–4.5 times longer and 3.6–28 times wider than lateral lobes. Stamens 44–50 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments proximally pu-


FIGURE 11. *Aphelandra heydeana* from Donnell-Smith's protologue in volume 18 of the Botanical Gazette (1893). 1, Habit; 2, Corolla opened to reveal stamens; 3–4, Bract; 5, Bractlets, calyx, and gynoecium; 6, Calyx (partially removed) and gynoecium. Magnifications not provided.

bescent with filamentous eglandular trichomes, distally glabrous or pubescent with filamentous eglandular trichomes to 0.5 mm long, thecae 5–7 mm long, pairs presented at ca. same height, all apically (and posterior pair dorsally) pubescent with cobwebby eglandular trichomes; staminode absent. Style 50–60 mm long, sparsely pubescent with eglandular trichomes throughout; stigma symmetrically funnelform, 0.2–0.3 mm long. Capsule not seen. (Fig. 11).

Distribution and Habitats.—Southern Mexico (Chiapas; Fig. 3), Guatemala, and El Salvador; plants occur in mixed deciduous forests with pines, pine-oak forests, and oak woodlands at elevations from 1,060 to 1,675 m.

Phenology.—Flowering: September–December.

Local Name.—"Flor de San Julián" (Gibson 1974, Guatemala).

Gibson (1974) and Wasshausen (1975) both based their report of this species in Mexico on a specimen here referred to *A. wendtii*. In fact, the species has been collected in Mexico only recently. The description above includes information from throughout the range of *A. heydeana*.

The reflexed, dentate, and apically caudate bracts of this species are similar to those of the Brazilian species, *A. chamissoniana* Nees. The closest relative of *A. heydeana* in North and Central America appears to be *A. wendtii*. These two species share numerous features including: conspicuously reflexed and usually dentate bracts, relatively large and abaxially glandular corollas, relatively long and apically pubescent thecae, and symmetrically funnelform stigmas. Distinctions between them are discussed under *A. wendtii*.

Additional Specimens Examined.—EL SALVADOR. **La Libertad:** Comasagua, *S. Calderón 1402* (GH, US). GUATEMALA. **Guatemala:** KM 7 on Central American Hwy. E of Guatemala City, *C. Davidson 3249* (ENCB, F, MO); above Lake Amatitlán, 3 mi S of Villa Canales, *W. Harmon 4635* (ENCB); Amatitlán, *J. Morales R. 1175* (F). **Huehuetenango:** 35 km W of Huehuetenango, *M. Madison 1769* (GH). **Santa Rosa:** Cerro Redondo, *E. Heyde & E. Lux 6212* (G, GH, K, US); Río Chiquito, *E. Heyde & E. Lux 6213* (F, GH, K, M, MICH, MO, US); near Oratorio, *P. Standley 60671* (F, US); Río Panal, lower slopes of Volcán de Tecuamburro between Cuilapa and Chiquimulilla, *P. Standley 78561* (F, US), *78568* (F, US). **Without locality:** *I. Aguilar 303* (F), *611* (F); *E. Heyde 355* (US). MEXICO. **Chiapas:** 1.5 km SW of Ojo de Agua along rd. from El Rosario to Niquivil, *D. Breedlove 65803* (CAS, MEXU, MICH, NY, US); Mpio. Motozintla de Mendoza, 10 mi SW of Motozintla, *P. Fryxell & E. Lott 3341* (CAS, CHAPA, ENCB). COUNTRY UNDETERMINED. Without locality, *Sessé et al. 279* (F, MA).

**10. Aphelandra guerrerensis** Wasshausen, Phytologia 26:393. 1973. Type.—MEXICO. **Guerrero:** Distr. Galeana, San Andrez, 1 June 1938, *G. Hinton et al. 11199* (Holotype: US!; isotypes: G!, GH!, K!, LL!, MICH!, NY!, UC, W!).

Shrub to 2 m tall. Young stems subterete to quadrate, pubescent near apex with flexuose to ascendant-appressed or retrorse-appressed eglandular trichomes 0.2–0.8 mm long, becoming glabrate. Leaves opposite, subsessile to petiolate, petioles to 130 mm long (naked portion to 55 mm long), blades ovate-elliptic to elliptic, 40–190 mm long, 14–80 mm wide, 2.1–3.9 times longer than wide, acuminate to subfalcate at apex, ± abruptly to gradually attenuate-decurrent (often nearly to or to node) at base, surfaces and margin sparsely pubescent (especially along veins) with cauline type trichomes or becoming glabrate, margin entire to subsinuate-crenate. Spikes terminal or axillary from distal nodes, elongate, up to 180 mm long (excluding flowers), 25–50 mm in diameter (excluding flowers) near midspike, rachis pubescent with straight to flexuose to antrorse glandular and/or eglandular trichomes 0.05–0.8 mm long. Bracts green or distal bracts sometimes green with red coloration on distal half, often spreading with age, lanceolate to ovate to elliptic, 15–35 mm long, 4.3–22 mm wide, 1.1–4.9 times longer than wide, proximal bracts often intergrading with leaves and somewhat larger, acute to acuminate to subfalcate, erect at apex, abaxial surface pubescent with straight to curved to flexuose glandular and eglandular trichomes 0.05–0.7(–1) mm long, margin ciliate with trichomes like those of abaxial surface, entire (proximal and sometimes distal bracts) or dentate (distal bracts) with 1 tooth per side, teeth 0.2–3 mm long (teeth usually present on at least one bract per inflorescence). Bractlets subulate to lanceolate to lance-subulate, 5.5–13(–17) mm long, 0.9–1.5(–2.5) mm wide, subaristate to aristate at apex, pubescent like bracts. Calyx 8–15 mm long, lobes lance-elliptic to lanceolate to lance-subulate, 1.5–3 mm wide at base, attenuate to aristate at apex, pubescent like bracts. Corolla red, 50–85 mm long, externally pubescent with glandular and eglandular trichomes 0.1–0.6 mm long distally and with mostly eglandular trichomes 0.1–0.7 mm long proximally, upper lip 19–36 mm long, entire at apex, margin flared at base, lower lip ± per-

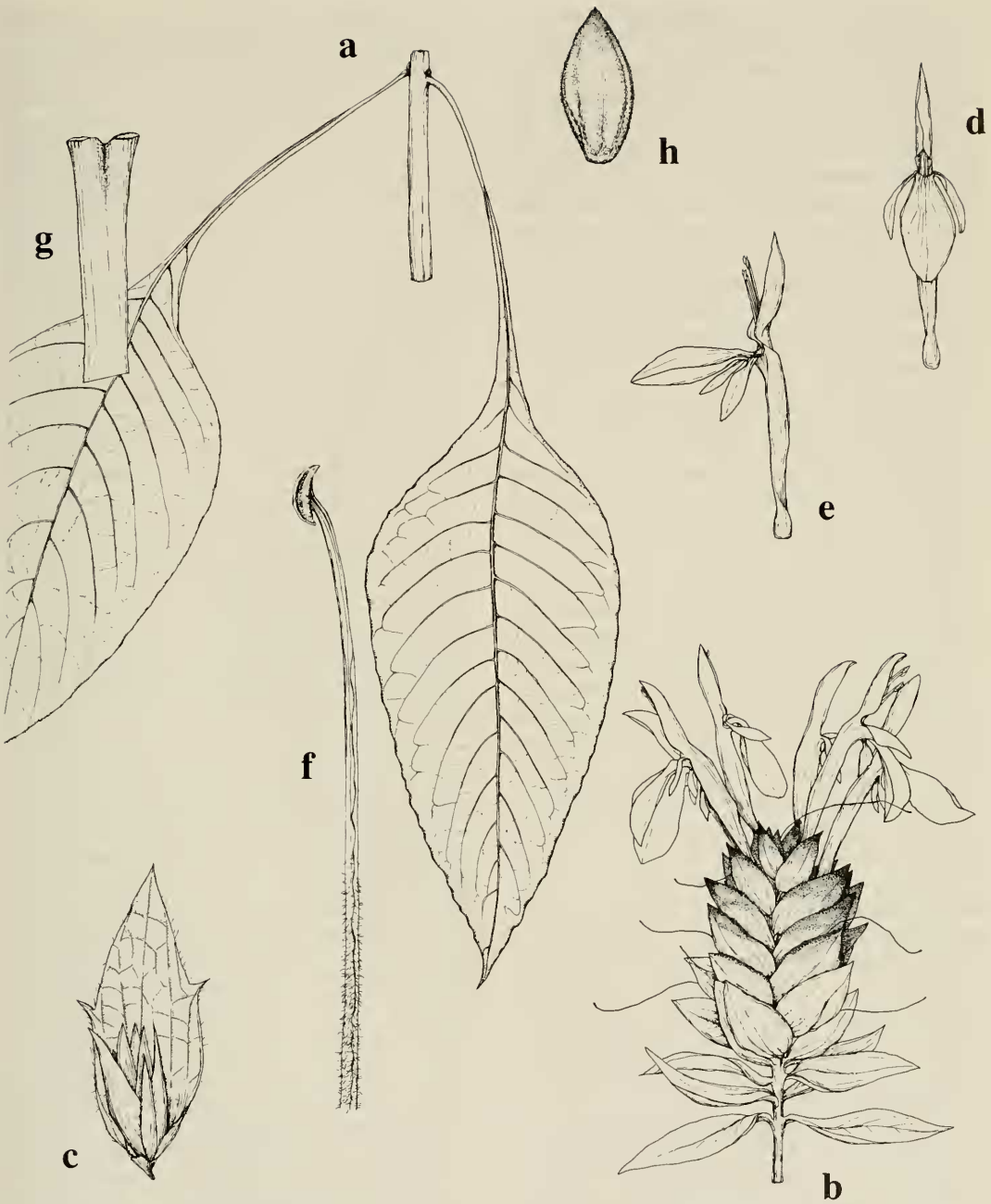


FIGURE 12. *Aphelandra guerrerensis*. a, Portion of stem with leaves, ×0.5 (*Daniel 5376*); b, Spike with flowers, ×0.5 (*Daniel 5376cv*); c, Bract, bractlets, and calyx, ×1.6 (*Daniel & Ton 6156*); d, Corolla with stamens, front view, ×0.5 (*Daniel & Ton 6156*); e, Corolla with stamens, side view with upper lip bent to reveal stamens, ×0.5 (*Daniel & Ton 6156*); f, Distal portion of stamen, ×2.1 (*Daniel 5376*); g, Distal portion of style with stigma, ×20 (*Daniel & Ton 6156*); h, Capsule, ×1.3 (*Daniel & Ton 6156*). Drawn by Nancy King.

pendicular to upper lip, 21–40 mm long, lateral lobes linear to lanceolate to oblanceolate, 7–21 mm long, 1.1–4.8 mm wide, lower-central lobe obovate to elliptic, 19–38 mm long, 5.7–19 mm wide, 1.7–3.1 times longer than and 2.7–6.7 times wider than lateral lobes. Stamens 40–60 mm long,

posterior pair inserted ca. 1 mm distal to anterior pair, filaments proximally pubescent with filamentous eglandular trichomes, distally glabrous, thecae 3–4.5 mm long, posterior pair extended up to 4 mm beyond anterior pair, apically and dorsally glabrous; staminode 0.7–1 mm long, glabrous or pubescent. Style 55–75 mm long, glabrous or very sparsely pubescent with eglandular trichomes; stigma symmetrically to asymmetrically funnelform, 0.1–0.4 mm long. Capsule 14–19 mm long, pubescent with straight to retrorsely appressed (proximally) eglandular trichomes 0.1–0.3 mm long. Seeds (immature) covered with stiff, dendritic or barbed trichomelike papillae. (Fig. 12).

Distribution and Habitat.—Southern Mexico (Guerrero and Oaxaca; Fig. 7); plants occur in moist broadleaf evergreen (e.g., riparian) forests in the oak and pine zones on the Pacific slopes of the Sierra Madre Sur at elevations from 600 to 1,400 m.

Phenology.—Flowering: November–February and June; fruiting: January–February.

Prior to this study, *A. guerrerensis* was known only from the type locality in southwestern Guerrero. With some hesitation, I include several collections from southwestern Oaxaca within this species. Plants from Oaxaca resemble the type in numerous important characters including bracteal margins, corolla form, thecal pubescence, and pollen apertures. They differ from Hinton's collection only by the presence of glands among the eglandular trichomes on the rachis, bracts, bractlets, and calyx. In the latter, glandular trichomes are absent on these structures. Considering the variability in glandularity of other species (e.g., *A. madrensis* and *A. schiediana*), it does not seem overly cautious to include these collections from Oaxaca in *A. guerrerensis* until such time as the relationships between them can be better resolved.

*Aphelandra guerrerensis* is most similar to *A. gigantiflora* and *A. schiedeana*. Its distributional range is generally to the south and west of that of the latter taxa. In addition to the contrasting character states noted above in the key to species, *A. guerrerensis* can be further distinguished from *A. gigantiflora* by its eglandular or less conspicuously glandular inflorescence rachis and from *A. schiedeana* by its seeds covered with trichomelike papillae.

Additional Specimens Examined.—MEXICO. **Oaxaca:** along Hwy. 131 between Puerto Escondido and Sola de Vega, 63.5 km N jct. Hwy. 200, *T. Daniel 5376* (C, CAS, DUKE, MEXU, MO), cuttings from this locale grown at San Francisco Conservatory of Flowers, *T. Daniel 5376cv* (CAS); along road between Puerto Escondido and Sola de Vega, 42 km N jct. Hwy. 200 in Puerto Escondido, *T. Daniel & A. Ton 6156* (CAS, ENCB, K, MEXU, MICH, NY, US); Río Salado along Puerto Escondido-Sola de Vega road, 72 km N jct. Hwy. 200 in Puerto Escondido, *T. Daniel & A. Ton 6163* (CAS, MEXU); along Puerto Escondido-Sola de Vega road 74 km N jct. Hwy. 200 in Puerto Escondido, *T. Daniel & A. Ton 6166* (CAS); KM 182–190, Oaxaca-Puerto Escondido, *T. MacDougall s.n.* (CAS, MEXU); Río Sal, Lachao, Juquila, *T. MacDougall s.n.* (ENCB, F); Cerro del Machete, Pochutla, *B. Reko 6051* (F).

**11. Aphelandra gigantiflora** Lindau, Bull. Herb. Boiss. 3:369. 1895. Type.—"Guatemala et Costarica," *A. Warscewicz s.n.* (Lectotype: GH!, designated here, see below). *Aphelandra schiedeana* var. *gigantiflora* (Lindau) D. Gibson, Fieldiana, Bot. 34:57. 1973.

*Aphelandra padillana* Standley, J. Washington Acad. Sci. 14: 244. 1924. Type.—EL SALVADOR. **Ahuachapán:** mountains near Ahuachapán, 1,000 m, 9–27 January 1922, *P. Standley 19972* (Holotype: US!).

*Aphelandra gigantiflora* forma *lutea* Standley & Steyermark, Field Mus. Bot. 23:237. 1947. Type.—GUATEMALA. **Escuintla:** barranca of Río Gavilán, NE of Escuintla, 720 m, 16 March 1941, *P. Standley 89560* (Holotype: F).

Shrub to 2.4 m tall. Young stems subquadrate to quadrate, sparsely to densely pubescent with straight to antrorse to antrorse-appressed eglandular trichomes 0.05–0.7 mm long. Leaves opposite, petiolate, petioles to 130 mm long (naked portion to 50 mm long), blades (lance-ovate to) ovate to elliptic, 40–255 mm long, 11–117 mm wide, 1.9–4.5 times longer than wide, acuminate to subfalcate at apex, (acute to) more or less abruptly to gradually attenuate-decurrent (often nearly or to node) at base, surfaces sparsely pubescent (especially along major veins) with antrorse eglandular trichomes, margin entire to subsinuate-crenate. Spikes terminal, elongate, up to 310 mm long (excluding flowers), 28–55 mm in diameter (excluding flowers) near midspike, rachis pubescent with straight to flexuose glandular and eglandular trichomes 0.1–1.2 mm long (viscid). Bracts reddish, ovate to elliptic to obovate-elliptic, 17–33 mm long, 7.2–21 mm wide, 1.6–3 times longer than wide, sometimes spreading with age, (rounded to) acute to acuminate, erect at apex, abaxial surface and margin pubescent like rachis and with eglandular trichomes as

short as 0.05 mm long as well, margin entire or dentate with 1–2 teeth per side, teeth 0.2–2.5 mm long. Bractlets subulate to lanceolate, 8–20 mm long, 0.6–1.5 mm wide, apex attenuate to aristate, pubescent like rachis. Calyx 11–17 mm long, lobes lanceolate to lance-subulate, 1.2–3.5 mm wide at base, attenuate to aristate at apex, pubescent like rachis. Corolla red, 55–74 mm long, externally pubescent like rachis, upper lip 16–29 mm long, entire to emarginate with rounded to subtriangular lobes 0.2–0.4 mm long at apex, margin not flared or proximally flared, lower lip ± perpendicular to upper lip to reflexed, 24–32 mm long, lateral lobes lance-linear to linear to linear-elliptic, 7–17 mm long, 1–5.5 mm wide, lower-central lobe obovate, 19–31 mm long, 8–17 mm wide, 1.6–3.7 times longer and 3.1–8.6 times wider than lateral lobes. Stamens 45–65 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments pubescent proximally and often distally with filamentous eglandular trichomes to 1 mm long, thecae 3.5–5.3 mm long, presented at ± same height or posterior pair extending up to 1 mm beyond anterior pair, posterior pair apically and dorsally pubescent with eglandular trichomes, anterior pair apically pubescent only or glabrous; staminode triangular or filamentous, 0.3–9 mm long, pubescent. Style 51–59 mm long, proximally pubescent with eglandular trichomes, distally pubescent or glabrous; stigma symmetrically funnelform to somewhat bilobed, 0.2–0.3 mm long. Capsule 17–21 mm long, pubescent with straight to flexuose eglandular trichomes 0.2–0.5 mm long. Seeds flattened, somewhat squarish, 3.7–5.5 mm long, 3–4.5 mm wide, surface covered with apically branched or dendritic trichomelike papillae to 0.2 mm long. (Fig. 10).

Distribution and Habitat.—Southern Mexico (Chiapas and Oaxaca; Fig. 3), Guatemala, and El Salvador; plants occur along streams and in mesic ravines in regions of tropical subdeciduous, moist, and pine-oak forest at elevations from 300 to 1,400 m.

Phenology.—Flowering: November–March; fruiting: January–March.

Local Name.—"Hierba del cadejo" (*Standley 19972,* El Salvador).

Some confusion exists concerning the type of this species. There are several Warscewicz collections of *A. gigantiflora* with various numbers and locality data. Photographs of a specimen that was at B, *Warscewicz 20* from "Costa Ricca et Veragua," were distributed to several herbaria by F (neg. no. 8707) under the heading "TYPES OF THE BERLIN HERBARIUM." Wasshausen (1975) cited *Warscewicz s.n.* from "Costa Rica et Veragua" as the type and noted that the specimen at B was destroyed, that there is an isotype at W, and that F photograph 8707 depicts the destroyed holotype. I was not able to locate a Warscewicz collection of this species at W. At G, there are specimens of *Warscewicz 22* and *23* from "Guatemala et Costa Ricca." The latter was annotated by Wasshausen as an isotype of *A. gigantiflora.* At GH, there is a specimen (ex B) of an unnumbered collection of Warscewicz from "Guatemala et Costarica." The collection numbers cited above are on the original labels and were written with the same pen as the locality information. Thus, they appear to be original numbers rather than later additions to the specimens. All of the specimens mentioned above were annotated by Lindau with his name. In the protologue, Lindau (1895b) provided only, "Guatemala et Costa Rica leg. v. Warscewicz." It is not known to me whether Lindau was including all of the Warscewicz collections in this statement of material examined or whether he was specifically indicating a collection with exactly this information (of which there is a duplicate at GH). The name, locality, and collector on the printed "Museum botanicum Berolinense" label at GH all appear to have been written by Lindau, who likely wrote the information on the labels of duplicates prior to distribution. Because the specimen at B (represented by F photograph 8707) has a locality at variance with that provided by Lindau in the protologue and because the number of that collection (*20*) was not cited by Lindau (who typically was attentive in citing collector's numbers in his descriptions), I do not believe that this specimen necessarily represented the holotype. If Lindau (1895b) was including all of Warscewicz's collections of *A. gigantiflora* in his statement, then all of the collections cited above (and possibly others as well) are syntypes (or possibly isosyntypes). If, instead, he was referring to a specimen at B with the information matching that of the protologue and that of the specimen at GH, then it would have been the holotype. Because it is a matter of

conjecture both as to what Lindau was including in his statement of material examined and as to what collections might have been at B prior to the destruction there in 1943, I propose that the specimen at GH be chosen as the lectotype of *A. gigantiflora.* Although it is not as complete a specimen as those at G, this specimen is either an isotype, a syntype, or, at the very least, an isosyntype.

Gibson (1972, 1974) treated *A. gigantiflora* as a variety of *A. schiedeana* and noted that the former differs from the latter only by its elongated inflorescence (10–30 cm long) with more conspicuously glandular rachises and bracts. Wasshausen (1975) maintained *A. gigantiflora* as a species distinguishable from *A. schiedeana* by its longer (6.5–7.5 cm vs. ca. 6 cm) corollas. These two species are indeed similar to one another, and although there are tendencies for longer spikes (8–31 cm vs. 4–11.5 cm) and longer corollas (5.5–7.4 cm vs. 4.1–7 cm) in *A. gigantiflora,* there is sufficient overlap in the lengths of these structures to question their usefulness in delimiting the two species. Based on the data accumulated in my studies, these two species with similar ranges can be distinguished more readily by the inflorescence pubescence and seed coat characters used in the key to species above. Morphological tendencies that may further assist in distinguishing the two species include bracteal apex shape (mostly acute to acuminate in *A. gigantiflora* vs. mostly rounded to abruptly acute in *A. schiedeana*) and bracteal margin (often dentate in *A. gigantiflora* vs. entire in *A. schiedeana*).

Gibson (1972, 1974) included both *A. padillana* and *A. gigantiflora* forma *lutea* in this taxon without comment. Wasshausen (1975) also included both names as synonyms of *A. gigantiflora* and agreed with Standley and Steyermark (1947) that *A. gigantiflora* forma *lutea* differs from the typical form only by its yellow corollas. He noted that in certain other species of *Aphelandra,* corolla color varies from red to orange-red to orange-yellow. Standley (1924) noted that *A. padillana* was common in the mountains of El Salvador. The collections he cited from El Salvador are similar in all characters to Guatemalan plants resembling the type of *A. gigantiflora.*

Information from plants occurring throughout the range of *A. gigantiflora* is included in the description above. Northern Central American plants of *A. gigantiflora* differ from those occurring in southern Mexico in several minor features that are summarized in the following couplet:

Bracts often ± conspicuously dentate; bractlets 13–20 mm long, 1–1.5 mm wide; lower lip of corolla with lateral lobes 1–2.8 mm wide and central lobe 2.2–3.7 times longer than lateral lobes; thecae 3.5–4.5 mm long, posterior pair extending 1–2 mm beyond anterior pair, the anterior pair glabrous. ..... Mexican plants.

Bracts entire or inconspicuously dentate; bractlets 8–14.5 mm long, 0.6–1.2 mm wide, lower lip of corolla with lateral lobes 2.5–5.5 mm wide and central lobe 1.6–2.3 times longer than lateral lobes; thecae 4.8–5.3 mm long, pairs presented at ± same height, the anterior pair apically pubescent. ..... Central American plants.

The overlap in many of these characteristics and the occurrence of similar variation (e.g., bracteal teeth can vary from present and conspicuous to absent on the same plant) in other species of *Aphelandra* precludes formal taxonomic recognition of the Mexican variants at this time. Additional collections and studies of *A. gigantiflora* are needed in order to understand better the variation among plants in southern Mexico and their relationship to those in Central America.

The differences noted among plants from these two regions permit some speculation about the Sessé and Mociño collections cited below. These collections (which probably represent only a single collection with duplicates distributed from Pavon's herbarium) resemble plants from Central America. Thus, they were likely collected by Mociño during his travels in 1769–98 through the region that is now Guatemala and El Salvador (McVaugh 1977).

Another collection from southern Mexico with similarities to *A. gigantiflora* has pollen that is apparently unique in the genus. *Delgado S. et al. 655* (Oaxaca: Mpio. Juquila, 16 km SO de San Pedro Juchatenango, sea 8 km E de Juquila, pine-oak forest at 1,600 m, CAS, CHAPA, ENCB, MEXU, NY) differs from *A. gigantiflora* primarily by its lance-ovate bracts. Unlike that described for any other species of *Aphelandra,* however, pollen from this collection has pseudocolpal (or colpoid) rings in each mesocolpium. Pollen from this collection (Fig. 2h, i) also lacks the three-armed polar apertures characteristic of *A. gigantiflora.* Because further collections and

studies will be necessary in order to determine its status, information from *Delgado S. et al. 655* is not included in the description above.

Additional Specimens Examined.—EL SALVADOR. **Ahuachapán:** without locality, *S. Padilla 418* (US); vicinity of Ahuachapán, *P. Standley 19771* (GH, US). **La Libertad:** Comasagua, *S. Calderón 1364* (US); Santa Tecla, *S. Calderón 1422* (US); Finca Paraíso on N slope of a mountain ¼ mi S of Santa Tecla, *M. Carlson 89* (UC); Puerta de la Laguna, *F. Weberling 2155* (M). **San Vicente:** Volcán de San Vicente, *P. Standley 21512* (GH, US); vicinity of San Vicente, *P. Standley 21680* (US). **Sonsonate:** Finca Chilata, *P. Standley 19315* (US). GUATEMALA. **Escuintla:** Río Guacalate, *P. Standley 60209* (US). **Guatemala:** Amatitlán, Barranca de Eminencia, *J. Donnell-Smith 2696* (US). **Sacatepéquez:** near Las Lajas, *P. Standley 58132* (US); below Barranco Hondo, *P. Standley 88992* (US). MEXICO. **Chiapas:** Mpio. Arriaga, La Mina Microwave Station, *D. Breedlove 56298* (CAS), *D. Breedlove & F. Almeda 60161* (CAS); Mpio. Cintalapa, near La Mina Microwave Station, *D. Breedlove & T. Daniel 70900* (CAS, DUKE, ENCB, F, GH, K, LL, MEXU, MICH, MO, NY, US); near La Sepulcura, 10 km N of Arriaga, *D. Breedlove & T. Daniel 70938* (CAS); Mpio. Arriaga, 13 km N of Arriaga along Hwy. 195, *D. Breedlove & E. McClintock 23739* (DS), *D. Breedlove & R. Thorne 30561* (DS); along Hwy. 190 ca. 2 mi E of Oaxaca border, *T. Croat 46289* (MO); Rizo de Oro, Cintalapa, *T. MacDougall s.n.* (F, MEXU); 40 km W of Tuxtla Gutiérrez on Hwy. 190, *M. Sørensen 18* (C). **Oaxaca:** Distr. Tehuantepec, 8.9 km N de Lachiguiri, *R. Torres C. et al. 4307* (CAS). COUNTRY UNDETERMINED. "Guatemala et Costa Rica," *A. Warscewicz 22* (G); without locality, *M. Sessé et al. 278* (F, MA); "Nouvelle Espagan," *M. Sessé et al. s.n.* ex hb. Pavon (G, OXF).

**12. Aphelandra schiedeana** Schlecht. & Cham. Linnaea 5:95. 1830. Type.—MEXICO. **Veracruz:** Hacienda de la Laguna, Barranca de Tioselo, October 1828, *C. Schiede 118* (Holotype: B, destroyed, photos F, G, GH, MICH, MO, US; lectotype: M!, designated here; isotypes: BM!, OXF!, W!). *Lagochilium schiedeanum* (Schlecht. & Cham.) Nees in Martius, Fl. Bras. 9:87. 1847.

Shrub to 2.3 m tall. Young stems subterete to quadrate, pubescent with antrorse-appressed eglandular trichomes 0.2–0.6 mm long, becoming glabrate, mature stems often with blisterlike projections. Leaves opposite, petiolate, petioles to 100 mm long (naked portion to 45 mm long), blades lance-elliptic to elliptic, 43–220 mm long, 9–60 mm wide, 2.7–5.8 times longer than wide, acuminate to subfalcate at apex, gradually to abruptly attenuate-decurrent (sometimes nearly to node) at base, surfaces sparsely pubescent with cauline type trichomes, becoming glabrate, margin entire to subcrenate. Spikes terminal, elongate, up to 115 mm long (excluding flowers), 20–40 mm in diameter (excluding flowers) near midspike, rachis pubescent with straight to flexuose to antrorse eglandular trichomes 0.2–0.4 mm long. Bracts reddish, green tinged with red, or entirely green, sometimes spreading with age, ovate to elliptic to obovate-elliptic, 11–30 mm long, 3.5–18 mm wide, 1.6–2.4 times longer than wide, rounded (and often slightly emarginate) to acute (to acuminate at base of spike), erect at apex, abaxial surface puberulent with eglandular and glandular (often absent) trichomes less than 0.05–0.2 mm long and often with some longer antrorse eglandular trichomes mostly along midvein, margin entire, ciliate with eglandular trichomes to 0.5 mm long. Bractlets subulate to lance-subulate, 6–14.5 mm long, 1–2 mm wide, subaristate to aristate at apex, abaxial surface pubescent with straight to antrorse (or flexuose along margin) eglandular trichomes (rarely with a few inconspicuous glandular trichomes as well) to 0.6 mm long. Calyx 9–15 mm long, lobes lanceolate, 2–3.2 mm wide at base, attenuate to aristate at apex, pubescent like bractlets. Corolla reddish, 41–70 mm long, externally pubescent with glandular and eglandular trichomes 0.2–0.9 mm long, upper lip 16–26 mm long, entire to emarginate with lobes subtriangular, 0.2–1 mm long at apex, margin not flared or proximally flared, lower lip ± perpendicular to upper lip, 18–28 mm long, lateral lobes linear to linear-lanceolate, 7.5–15 mm long, 1–3.7 mm wide, lower-central lobe obovate, 17–28 mm long, 6–14.5 mm wide, 1.8–2.4 times longer and 2–6.1 times wider than lateral lobes. Stamens 37–53 mm long, posterior pair inserted ca. 1 mm distal to anterior pair, filaments nearly glabrous to pubescent throughout with filamentous eglandular trichomes, thecae 3–5.5 mm long, posterior pair extending up to 2.5 mm beyond anterior pair, posterior pair dorsally and often apically pubescent with cobwebby hairs, anterior pair glabrous; staminode not evident or triangular and 0.2 mm long. Style 38–58 mm long, glabrous or pubescent with eglandular trichomes; stigma symmetrically funnelform, 0.2–0.4 mm long. Capsule 13–22 mm long, densely pubescent with straight to retrorse eglandular trichomes 0.1–0.3 mm long. Seeds flattened, somewhat squarish, 4–6 mm long, 3.5–4.5 mm wide, nearly smooth or irregularly covered with low, rounded encrustations.

Distribution and Habitat.—Southern Mexico (Chiapas, Oaxaca, and Veracruz; Fig. 9), Guatemala, and El Salvador; plants occur in

regions of montane rain forest, pine-oak forest, and cloud forest at elevations from 900 to 2,460 m; sometimes cultivated for ornament.

Phenology.—Flowering: July–March; fruiting: December–April.

Wasshausen (1975) noted that *A. schiedeana* was known only from Mexico and Guatemala whereas Gibson (1974) included El Salvador within the distributional range of the species but did not cite any collections from the latter country. The occurrence of *A. schiedeana* in El Salvador is documented by the specimen cited below.

In addition to the characters noted in the key above, this species is usually recognizable by its elliptic, apically rounded or abruptly acute, marginally entire, and eglandular puberulent (i.e., with trichomes up to 0.2 mm long) bracts. Plants from Veracruz and Oaxaca all have bracts of this types. Some plants from Chiapas (e.g., *Breedlove 49662, Laughlin 419, Matuda 5211,* and *Ton 2087*), Guatemala (e.g., *Metzler 39, Skutch 1724,* and *Williams et al. 26112*), and El Salvador (e.g., *Williams et al. 15159*) have bracts with somewhat longer (i.e., up to 0.5 mm) eglandular trichomes either on the proximal portion, along the midvein, or near the apex of the bracts and inconspicuous glandular trichomes (up to 0.2 mm long) on the distal portion of the bracts. Such bracts show similarities to some of those in *A. gigantiflora* and *A. guerrerensis. Aphelandra schiedeana* can always be distinguished from the latter two species by its seeds that lack trichome-like papillae. Unfortunately, seeds are not often present on flowering collections of *Aphelandra. Aphelandra schiedeana* can be distinguished further from *A. guerrerensis* by the presence of three-armed polar apertures on its pollen grains and from *A. gigantiflora* by its eglandular inflorescence rachis and inconspicuously glandular (if at all) bracts. Bracteal margin (entire vs. often dentate) is a character tendency that can also be useful for distinguishing *A. schiedeana* from these species. Further distinctions are discussed under *A. guerrerensis* and *A. gigantiflora.*

Additional Specimens Examined.—EL SALVADOR. **Santa Ana:** Finca Pilón, Cerro de Los Naranjos, Volcán Santa Ana, *L. Williams et al. 15159* (MO). GUATEMALA. **El Quiché:** waterfalls 4 km N of Nebaj, *M. Metzler 39* (MO). **San Marcos:** S of San Marcos toward Castalia, *L. Williams et al. 26112* (UC, W). MEXICO. **Chiapas:** Mpio. Tenejapa, Yochib, paraje of Kotol Te', *D. Breedlove 7367* (DS, F, MICH, US); Mpio. Tenejapa, near paraje Yashanal, *D. Breedlove 49662* (CAS, LL, NY); Mpio. Tenejapa, near Yochib, Paraje Koltolte', *D. Breedlove 53401* (CAS); Mpio. Motozintla de Mendoza, SW side of Cerro Mozotal, 11 km NW of jct. of rd. to Motozintla along rd. to El Porvenir and Siltepec, *D. Breedlove & B. Bartholomew 55761* (CAS); Cerro Briyo, between Rancho Concepción and Obispo (between Ocozocoautla and Villaflores), *I. Langman 3876* (US); Mpio. Zinacantan, paraje Vo'bits, *R. Laughlin 419* (DS, F, US); Mt. Ovando, *E. Matuda 126* (GH, LL, MEXU, MICH, MO, US), *3955* (GH, MEXU, MICH, MO), *6100* (F, LL, MEXU, MO, US); Fraylesca, near Siltepec, *E. Matuda 5211* (F, LL, MEXU, MO, US); Estacado, Mapastepec, *E. Matuda 18219* (MEXU); Jalapa, Triunfo, Escuintla, *E. Matuda 18454* (DS, F); Sn. Juan P., Escuintla, *E. Matuda 18470* (F, MEXU); Rancho Concepción y Cerro Brujo, *F. Miranda 5158* (MEXU); Sierra Soconusco, from Escuipulas to Cañada Honda, *E. Xolocotzi & A. Sharp X-302* (DS); Mpio. Tenejapa, paraje of Yash'anal, *A. Ton 2087* (DS, ENCB, F, LL, MICH, US). **Oaxaca:** Hwy. 125 between Tlaxiaco and Pinotepa Nacional, 1.53 mi N of Putla de Guerrero, *T. Croat 45912* (MO); Distr. Putla, La Cascada, 5 km NE de Hacienda sobre el camino San Vicente-San Isidro, *A. García M. et al. 3146* (CAS); Mpio. Tuxtepec, Isla de Málsaga, en la presa Miguel Alemán, *L. González Q. 1786a* (DS, F, MICH, MO); Distr. del Centro, *Herrgo & C. Conzatti H* (US); Río Chicahuastla, S. Vicente Putla, *T. MacDougall H151* (NY, US); Distr. Teotitlán, 5.1 km NW de Huautla de Jiménez hacia Teotitlán del Camino, *R. Torres C. & M. Antonio M. 6547* (CAS). **Veracruz:** Orizaba, *D. Bilimek 314* (P), *341* (GH, K, P), *M. Botteri 156* (P), *249* (GH), *800* (BM, G, K, P); Cerro de San Cristóbal, Orizaba, *R. Bonilla B. F-4334* (CHAPA); Vallee de Cordova, *E. Bourgeau 1998* (G, P); Région d'Orizaba, Río Blanco, *E. Bourgeau 3099* (BR, C, G, GH, K, M, MICH, MO, P, S, US); Teocelo, Cascada de Texolo, 5 km de Teocelo, *J. Calzada 2069* (F); El Marzo, 1 km adelante de Santa Ana Atzacan, 18°55'N, 97°05'W, *G. Castillo C. et al. 133* (CHAPA, F); Teocelo, Barranca de Teocelo, *M. Chazaro B. 1210* (F), *M. Chazaro B. et al. 1064* (F), *M. Zola B. 125* (F); Río Jamapa, ca. 4 mi NE of Coscomatepec, *T. Croat 43965* (MO); Cascada de Texolo a 5 km de Teocelo, *J. Ismael C. 2069* (ENCB); Cerro San Cristóbal, W of Orizaba, *I. Langman 3592* (US); Cerro San Cristóbal frente a Orizaba, *A. Lot 1104* (CHAPA, F, GH, LL); near Orizaba, *C. Pringle 5910* (US), *5912* (GH, MEXU, US); Cerro de San Cristóbal, 5 km SW de Orizaba, *J. Rzedowski 12180* (ENCB); Tuxpango, *A. Sharp 441705* (MO); près la Vera Cruz, *A. Sumichrast 806* (G); Mpio. Teocelo, Teocelo, *F. Ventura A. 11915* (MEXU), *12241* (MEXU); Mpio. Teocelo, La Barranca, *F. Ventura A. 14836* (MEXU); Mpio. Chocamán, Río de Chocamán, *F. Ventura A. 17847* (MEXU). **State undetermined:** without locality, *C. Schiede & F. Deppe s.n.* 28 Aug. (OXF), *A. Sumichrast 800* (G).

## Acknowledgments

I am grateful for the financial assistance provided by the National Science Foundation (BSR-8609852) and the California Academy of Sciences for my work on Mexican Acanthaceae. Loans from and/or visits to the following herbaria (acronyms fide Holmgren et al. 1990) made this study possible: A, ARIZ, ASU, B, BM, BR, C, CAS, CHAPA, DS, DUKE, E, ENCB, F, G, GH, IBUG, K, LL, M, MA, MEXU, MICH,

MIN, MO, NCU, NY, OXF, P, PR, PRC, S, TEX, UC, UCR, US, W, WIS. The San Francisco Conservatory of Flowers kindly provided greenhouse space for cultivation of some species of *Aphelandra*. I am indebted to the following individuals for their assistance: Frank Almeda, Bruce Bartholomew, Dennis Breedlove, Mary Butterwick, Vince Lee, Emily Lott, Alush Ton, Tom Wendt (field assistance); S. Barrier, Dick Brummitt, A. Charpin, Lucinda McDade, and Dieter Wasshausen (discussions and/or information); Lisa Borok, Charlotte Fiorito, Nancy King, and Mary Ann Tenorio (illustrations, photography, and scanning electron microscopy); William R. Anderson (arranging for and permitting use of illustration by Karin Douthit); Tsan Iang and Fei Mei Chuang (cytological work), and C. E. Freeman (nectar sugar analysis).

## Resumen

Se encuentran 12 especies del genero *Aphelandra* en México: *A. aurantiaca, A. gigantiflora, A. guerrerensis, A. heydeana, A. hintonii, A. lineariloba, A. madrensis, A. scabra, A. schiedeana, A. speciosa, A. verticillata,* y *A. wendtii.* Seis (*A. guerrerensis, A. hintonii, A. lineariloba, A. madrensis, A. verticillata,* y *A. wendtii*) son endémicas al país. Se describe *A. wendtii* como especie nueva de las selvas cálido-húmedas de Veracruz, Tabasco, y Chiapas. Se designa un neotipo para *Hemisandra aurantiaca* y se designan lectotipos para *A. acutifolia, A. aurantiaca* var. *roezlii, A. gigantiflora, A. haenkeana, A. madrensis,* y *A. schiedeana.* El polen de todas las 12 especies es tricolpado. Seis especies tienen un número de cromosomas de $n = 14$. Claves a los géneros mexicanos de Aphelandreae y las 12 especies de *Aphelandra* en México son presentadas.

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## Appendix A

Specimens of *Aphelandra* from which Pollen was Examined

*A. aurantiaca*: *D. Breedlove & T. Daniel 71287, G. Shapiro 262*; *A. gigantiflora*: *D. Breedlove & T. Daniel 70900, P. Standley 19771*; *A. guerrerensis*: *T. Daniel 5376gh, G. Hinton et al. 11199, B. Reko 6051*; *A. heydeana*: *D. Breedlove 65803*; *A. hintonii*: *Hinton et al. 16049*; *A. lineariloba*: *T. Daniel 2138cv*; *A. madrensis*: *T. Daniel 5276, E. Langlassé 806, E. Lott 865*; *A. scabra*: *T. Daniel 5328*; *A. schiedeana*: *D. Breedlove 53401, F. Ventura A. 12241*; *A. speciosa*: *T. Croat 40837*; *A. verticillata*: *T. Daniel et al. 3295, G. Hinton 13486, H. Moore 5503, J. Rzedowski 27991*; *A. wendtii*: *D. Breedlove & A. Smith 22121, T. Daniel & T. Wendt 5813*; *A. sp.*: *A. Delgado S. 655*.

## Appendix B

Index to Collections Examined

The numbers in parentheses refer to the corresponding species in the text.

Abbott, R. 506 (1).
Acosta, M. & J. Dorantes 613 (2).
Acosta P., R. et al. 32 (2).
Aguilar, I. 303 (9), 611 (9).
Alva, R. & S. Cook 1677 (6).
Alvarez G., A. 23 (5).
Anderson, W. & C. Laskowski 4224 (2).
Andrieux, G. 131 (2).
Andrle, R. 87 (3).
Angel R., O. s.n. (6).
Arcos V., R. 151 (2).
Armor, A. V30 (2).
Avila B., C. 5 (12).
Barclay, G. 1973 (2).
Barr, R. & Dennis 65-373A (3).
Beaman, J. 5195 (3).
Bilimek, D. 314 (12), 341 (12).
Boege, W. 374 (2), 497 (2).
Bonilla B., R. F-4334 (12).
Botteri, M. 156 (12), 249 (12), 800 (12).
Bourgeau, E. 1998 (3), 1998 (12), 3099 (12).
Bradburn, A. & S. Darwin 1176 (2), 1185 (2).
Breedlove, D. 4241 (6), 6463 (2), 7367 (12), 7609 (2), 13879 (2), 20154 (2), 26116 (3), 26460 (3), 26524 (7), 27476 (2), 27890 (2), 28299 (2), 28856 (7), 28950 (2), 29011 (2), 31250 (3), 33349 (2), 36727 (2), 37621 (2), 38236 (2), 42842 (2), 47219 (2), 47311 (3), 47327 (2), 47343 (7), 47345 (3), 47363 (3), 49151 (3), 49152 (2), 49662 (12), 52486 (2), 52540 (7), 52785 (2), 53401 (12), 53638 (2), 56298 (11), 56376 (2), 65534 (2), 65803 (9), 66976 (2), 70400 (2), 70668 (2).
Breedlove, D. & F. Almeda 48406 (7), 48438 (3), 57212 (3), 57214 (7), 57242 (2), 57256 (3), 57522 (3), 60161 (11), 60706 (6).
Breedlove, D. & B. Bartholomew 55761 (12).
Breedlove, D. & T. Daniel 70900 (11), 70909 (2), 70938 (11), 71274 (3), 71287 (3), 71320 (2).
Breedlove, D. & G. Davidse 55322 (2).
Breedlove, D. & R. Dressler 29788 (3).
Breedlove, D. & B. Keller 49550 (3).
Breedlove, D. & E. McClintock 23729 (11), 23772 (2).
Breedlove, D. & P. Raven 13351 (2).
Breedlove, D. & A. Smith 21959 (2), 22121 (7), 22247 (7), 22544 (2).
Breedlove, D. & J. Strother 46596 (2), 46841 (2), 46900 (7).
Breedlove, D. & R. Thorne 20667 (2), 30561 (11), 30734 (2).
Butterwick, M. 184 (2).
Cabrera, E. & G. Durán 750 (2).
Cabrera, E. & H. de Cabrera 3301 (2), 6199 (2), 9474 (2), 9562 (2), 9673 (2), 10786 (2), 10986 (2).
Cabrera, E. & L. Cortez 191 (2), 269 (2), 339 (2).
Cabrera, E. & R. Torres 1073 (2).
Calderón, S. 1364 (11), 1402 (9), 1422 (11).
Calzada, J. 59 (3), 1052 (2), 1537 (3), 1626-B (2), 2069 (12).
Calzada, J. & A. Gómez-Pompa 2304 (2).
Calzada, J. et al. 3788 (2), 6461 (2).
Cano D., R. 6 (7).
Carlson, M. 89 (11), 3066 (2).
Castillo C., G. et al. 133 (12).
Cedillo T., R. & R. Torres 1044 (2).
Cedillo T., R. et al. 1649 (2).
Chan, C. & E. Ucan 871 (2).
Chavelas P., J. et al. ES2391 (2), ES-4281 (2).
Chazaro B., M. 1210 (12).
Chazaro B., M. et al. 1064 (12).
Chiang, F. 334 (2).
Chiang, F. et al. 949 (2).
Cochrane, T. et al. 11722 (5).
Conzatti, C. 3735 (2).
Cortés, L. & R. Torres C. 36 (2).
Cowan, C. 5025 (2).
Croat, T. 5777 (2), 40837 (4), 43885 (2), 43965 (12), 45704 (2), 45415 (6), 45912 (12), 46289 (11), 47496 (2), 47519 (2).
Croat, T. & D. Hannon 63133 (3).
Crockett, R. 150 (2).
Cruz, C. de la, V. s.n. (6).
Cuevas, R. & G. Nieves 2141 (6).
Cuming, H. 1099 (2).
Daniel, T. 1282 (2), 1289 (2), 2102 (6), 2114 (6), 2122 (6), 2138 (5), 2138cv (5), 5251 (6), 5274 (6), 5276 (6), 5328 (2), 5328cv (2), 5331 (2), 5374 (2), 5376 (10), 5376cv (10).
Daniel, T. & B. Bartholomew 4870 (6), 4874 (6), 5028 (2).
Daniel, T. & M. Butterwick 3232 (6).
Daniel, T. & A. Ton 6106 (6), 6150 (2), 6156 (10), 6163 (10), 6166 (10), 6198 (2), 6204 (2).
Daniel, T. & T. Wendt 5808 (3), 5813 (7).
Daniel, T. et al. 3295 (1), 5867 (2).
Darwin, S. et al. 2166 (2).
Davidse, G. et al. 29721 (2), 30143 (2).
Davidson, C. 3249 (9).
Degener, O. & I. Degener 26785 (2).
Delgado S., A. 655 (see discussion under 11).
Delgado S., A. et al. 799 (2).
Diaz L. 9406 (5).
Dillon, M. et al. 1781 (3).

Donnell-Smith, J. 2696 (11).
Dorantes, J. 367 (2).
Dorantes, J. et al. 922 (2), 5082 (2), 5136 (2).
Dressler, R. & Jones 230 (2).
Dreyer, D. 343 (2).
Emrick, G. 52 (5).
Ernst, W. 2555 (2).
Espejo, A. et al. 1233 (2).
Faberge, A. s.n. (3).
Feddema, C. 2568 (6), 2590 (6).
Flores C., J. 246 (1).
Flügel, H. & E. Geiseler 7017 (2).
Fryxell, P. & E. Lott 3341 (9).
G., H. 11 (4), 16 (4).
Galeotti, H. 909 (2), 914 (3), 946 (3).
García F., J. & J. Palma G. 84 (2).
García M., A. et al. 3146 (12).
García N., R. s.n. (6).
Gaumer, G. 300 (2), 1488 (2), 1569 (2), 24144 (2), s.n. (2).
Gaumer, G. et al. 23587 (2), 23650 (2), 23798 (2).
Gaxiola, G. 190 (2).
Gentry, H. 5655 (6).
Gentry, A. & E. Zardini 48868 (2).
Ghiesbreght, A. 57 (2), 700 (2).
Gilly, C. 36 (2).
Gilly, C. & E. Hernández X. 393 (2), 399 (7).
González L., J. 276 (2).
González Q., L. 1786a (12), 1821 (2).
Gouin s.n. (2).
Greenman, J. 71 (2).
Grisebach s.n. (2).
Guevara S., S. 115 (3), 135 (3), 150 (3).
Haenke, T. s.n. (1).
Hammel, B. et al. 15650 (7).
Hancock, W. 47 (2).
Harmon, W. 4635 (9).
Hawkins, B. 102 (3).
Hernández A., F. & J. Hernández 513 (6).
Hernández G., H. 342 (2), 440 (3), 478 (3), 806 (2), 920 (2), 1463 (3), 1517 (2).
Hernández G., H. & C. González L. 1591 (3), 1649 (3).
Hernández M., R. 2354 (4).
Hernández X., E. 104 (2).
Hernández X., E. & A. Sharp X-301 (2).
Hernández, R. et al. 483 (3).
Herrera C., N. 35 (2).
Herrgo & C. Conzatti H (12).
Heyde, E. 355 (9).
Heyde, E. &. E. Lux 4037 (9), 6212 (9), 6213 (9).
Hilerio A., L. 5 (2).
Hinton, G. 2971 (1), 3156 (5).
Hinton, G. et al. 7412 (5), 9903 (2), 10919 (2), 11062 (6), 11199 (10), 11477 (2), 11648 (5), 12881 (5), 13486 (1), 13623 (5), 14691 (2), 15794 (5), 16042 (6), 16062 (6), 12675 (6), 15912 (6), 16049 (8).
Hoover, W. 226 (2).
Houck, R. 22 (3).
Howell, J. 8482 (2).
Huft, M. & E. Cabrera 2413 (7).
Ibarra M., G. 879 (3).
Ibarra M., G. & S. Sinaca 1114 (3).
Ibarra M., G. et al. 2142 (3).
Iltis, H. & R. Guzman M. 29130 (6).
Iltis, H. & A. Lasseigne 843 (2).
Iltis, H. & M. Nee 1640 (6).
Ismael C., J. 2069 (12).
Janzen, D. s.n. (2).
Judziewicz, E. et al. 5173 (6).
Jürgensen, C. 648 (3).
Juzepczuk, S. 1109 (2).
Kerber, E. s.n. (2).
Kimnach, M. & H. Sanchez M. 2261 (6).
Koch, S. & P. Fryxell 83117 (2).
Koch, S. et al. 73136 (2), 78292 (2).
Langlassé, E. 679 (2), 806 (6).
Langman, I. 3309 (2), 3592 (12), 3876 (12).
Lathrop, E. & R. Thorne 7256 (2).
Laughlin, R. 419 (12), 2024 (2).
Lay, G. & A. Collie s.n. (2).
Leger, F. 1033 (6).
Leuenberger, B. & C. Shiers 2708 (5).
Liebmann, F. 10603 (3), 10604 (3), s.n. (3), s.n. (2).
Linden, J. 177 (3), 189 (2), 540 (3), s.n. (2).
Lot, A. 555 (2), 1104 (12).
Lott, E. & J. Magallanes 865 (6).
Lott, E. et al. 985 (5).
Lundell, C. 1227 (2), 17855 (2).
MacDougal, J. & J. Miley 494 (6).
MacDougall, T. 31 (3), 564.S (3), H5 (2), H56 (2), H135 (2), H151 (12), s.n. (10), s.n. (3), s.n. (2), s.n. (11).
Madison, M. 1769 (9).
Magaña, M. & S. Zamudio 524 (2), 987 (3).
Marcks, B. & C. Marcks 959 (7).
Martínez A., G. 47 (2).
Martínez C., G. 205 (2), 254 (2), 397 (3), 808 (2), 1150 (2), 1774 (3), 2198 (3).
Martínez G., L. et al. 6 (7).
Martínez R., C. 263 (2), 926 (2), 1098 (2), 1168 (2).
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